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THE UNIVERSITY OF ALBERTA

A FACTORIAL STUDY OF STUDENT ASSESSMENTS OF TEACHER PERFORMANCE

by

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ABSTRACT

The accurate evaluation of teaching proficiency is necessary for planned professional improvement. There are many sources of teacher evaluation--ratings by principals, superintendents, professors of education, pupils, and so on--and many writers have assumed that the most valid assessments are made by the pupils since they are the 'consumers' in most continuous contact with the teacher. The present study is an attempt to determine the dimensions of teacher evaluation by pupils.

Approximately two thousand students from grades three to nine in various areas throughout the province completed, as part of a larger research program, a questionnaire designed to measure their responses to classroom proceedings and personalities. All were in the classrooms of teachers who had been members of the one-year training program in the Faculty of Education during the prior year.

Two dimensions were established and found to be supported by theoretical positions; firstly, a factor describing the extent of student participation in classroom activity and secondly, a factor describing student

awareness and concern with the disciplinary and restrictive facets of the classroom. No developmental trends in the strength and incidence of factors were observed, although the possibility of associations between sex and dissatisfaction with instruction at the junior-high school level and the age of students and their concern with the 'group' was raised.

These findings together with the other dimensions of pupil response which were observed form a groundwork for the future study of the conceptual framework used by pupils to evaluate the performance of their teachers.

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CHAPTER I

INTRODUCTION TO THE PROBLEM

Every human performance has to be evaluated against an ideal if closer approximation to that ideal is to be realized. This is particularly true of teaching where evaluation is required in selecting candidates for employment, promoting employees, diagnosing impending failures, and determining the direction of proposed changes in learning situations. The massive research attack on the problem of teacher evaluation has steadily mounted since the beginnings of educational research. The first paper appears to be that by Book (1905) and since that time, in excess of five hundred studies have been reported. The usable findings, however, have been negligible as Barr (1953) forcefully indicates.

> The simple fact of the matter is that after forty years of research on teacher effectiveness during which a vast number of studies have been carried out, one can point to few outcomes that a superintendent of schools can safely employ in hiring a teacher or granting him tenure, that an agency can employ in certifying teachers or that a teacher education faculty can employ in planning or improving teacher education programs. (1953, p. 657)

Despite this, both laymen and professional researchers still attack the problem, sometimes for emotional rather than logical reasons. Troyer (in Beecher, p. vii) for example, comments to the effect that every sound reason for supporting

the evaluation of pupil progress can be applied with equal validity to the evaluation of teacher effectiveness and that every sound reason against the evaluation of teacher effectiveness is equally applicable against the evaluation of pupil progress. This is hardly original for Mencius, four centuries before the birth of Christ, said much the same thing in advising heads of state.

> When all those about you, the ruler, say that a man is talented, do not immediately rush to promote him. Only after his subordinates say so also, should you examine him more fully as a candidate for promotion. (Quoted from Bass, 1960, p. 113)

Vanderwerf (1958), in our own time, makes a similar observation.

> One may certainly learn about teachers from their students. Moreover, any administrator who ignores such information does so at his own peril. (1958, p. 24)

There is clearly an acute need for the development of a scientific approach to the problem of teacher evaluation, for it is and will continue to be an issue which is very much alive. The present study is designed to explore but one approach to the evaluation of teacher proficiency, that involving the utilization of student responses.

CHAPTER II

THEORY AND RESEARCH RELATED TO THE INVESTIGATION

This chapter is devoted to an exposition of theory applicable to the problem of teacher evaluation, or evaluation in general, and to a review of the research regarding pupil evaluation of teacher proficiency.

I. THE GOOD TEACHER: A CATEGORY

Although there is little doubt that the evaluation of teaching is an important requirement of any educational system, there is a diversity of opinion regarding the manner in which it can be best accomplished. Evans (1959) observes, in agreement with what would probably be the consensus, that,

> the obvious way to go about studying teaching ability is to consider various qualities which it is reasonable to expect in good teachers and to attempt to relate them to the level of observed efficiency. (1959, p. 25)

Accordingly, the concept of a 'good teacher' becomes a category, (Bruner, 1951, p. 123) the identifying cues or criterial attributes of which must be based on value judgments, and, since different people have different systems of values, the concept of 'good teacher' must necessarily be a disjunctive one. (Bruner, 1956)

> Members of a disjunctive class exhibit defining attributes such that one or another of these attributes can be used in identifying or categorizing them. (1956, p. 156)

Bruner continues, making a statement particularly relevant to the category 'good teacher'.

> What is particularly difficult about attaining a disjunctive category is that two of its members, each uniform in terms of an ultimate criterion may have no defining attributes in common. (Ibid. pp. 156-157)

There is then, in such a category, no core of universal common factors, in fact, the various identifying attributes may bear little similarity to one another and consequently the category members may appear vastly different from one another. Despite this fact, we persistently try to change the category 'good teacher' into a conjunctive one wherein the criterial attributes are well known and agreed upon by all. Bruner describes at some length the process of "conjunctivization" by which a disjunctive category is made conjunctive. For example, an individual might be a clinical psychologist on the strength of any of a number of criterial attributes, yet an examination is generally imposed thus making all clinical psychologists in a given area members of a conjunctive rather than a disjunctive category. Similarly, as Bruner continues, the elite may be so categorized because of wealth, membership in a distinguished family, or self-

achieved fame, but to simplify the problem of their identification, societies to which all such persons belong are created. Indeed, as Bruner relates,

> one eventually begins to wonder whether Nature herself does not abhor disjunctive groupings. (Ibid. p. 162)

We operate as though the 'good teacher' is a conjunctive category; whereas, it is in fact a disjunctive one. The consequences are serious. As Smith (1962) recognizes,

> for almost four decades we have been making study after study in our attempt to measure teacher effectiveness. In all these studies we proceeded as if we knew what teaching is and that all we had to do was give tests to find out its effects. (1962, p. 326)

In an earlier work Bruner comments on the process of perception in a manner particularly applicable to the problem of evaluating teaching proficiency. He notes that perception commences on the basis of an expectancy or an hypothesis, that is, we perceive in accordance with some form of established pattern, however nebulous it might be.

> We not only see but we look for, not only hear but listen to. In short, perceiving takes place in a 'tuned organism'. (Quoted from Blake, 1951, pp. 123-124)

How is the organism tuned? This cognitive tuning is very largely a product of past experience and training. In Bruner's terms,

> any given hypothesis results from the arousal of central cognitive and motivational processes by preceding environmental states of affairs. (Ibid. p. 124)

Harvey, Hunt, and Schroder (1961, p. 204) advance similar ideas. They state that the functioning of conceptual systems which they define as the "immediate antecedents of cognitive and behavioral outcomes," determines the aspects of a situation which will result in confirmation and refutation.

Applying these statements to the evaluation of classroom performance, it would follow that the evaluator's conceptual system should determine which aspects of a performance he perceives as criterial cues of good teaching, certain occurrences confirming his expectations, others refuting them. The authors deal with four types of conceptual systems, one of which is particularly relevant to the evaluation of teaching and its foundation in cultural values. The systems are identified on the basis of their positive poles (openness) and negative poles (closedness), the applicable system designated as open to agreement with generalized external standards and closed to violation of these external standards. This system is described as one in which there is a "sensitivity to cues concerned with external rules, norms, and cultural prescriptions, with a minimum of alertness to other variations between people." (Ibid. p. 211)

It is thus sensitized to agreement or disagreement with external standards and confirmed by those events which are in agreement with the external standards. 'Interpretive maneuvers', or attempts to keep the system intact, therefore involve avoiding situations which violate the external standard, either through bolstering (re-affirming the nature of external rules) or neutralizing (denying the violation of external rules). A system such as this can thus be viewed as applicable to the evaluation of teaching, the evaluator having a set of established standards to which he believes teaching must conform. He observes and commends the behaviors in keeping with his hypotheses and ignores other, perhaps equally effective, behavior. Whenever he does observe behavior apart from or in contrast to his expectations he might be expected to condemn it. Should a particular situation seriously threaten his views, he avoids it either by bolstering, (re-affirming his own scheme) or neutralizing (denying the existence of the threat). The functioning of this system (#1), it would seem, explains the influence of cultural values in the evaluation of classroom procedures and establishes the nature of the problems encountered therein, a position taken by Anderson and Hunka (1963). As Rokeach (1960) suggests,

> The basic characteristic that defines the extent to which a person's system is open or closed; is namely, the extent to which the person can receive, evaluate, and act

> on relevant information received from the outside on its own intrinsic merits, un-encumbered by irrelevant factors in the situation arising within the person or from the outside. (1960, p. 57)

It seems reasonable to assume that the sort of closed-mindedness described here will characterize adults rather than children, for the child's value system should be more flexible in that he is less sensitive to the socially desirable attributes of perceptual behavior. If this is so, then children's evaluative ratings of teacher performance are less likely to be susceptible to defensive distortions than are those of adults, and accordingly, they merit the sort of research attention provided in the ensuing pages.

II. STUDENT EVALUATION OF TEACHING

The belief that students are competent raters of teacher performance is by no means new. Armchair theorists are constantly making this assertion, their views constituting a rather interesting introduction to the area. The student, it is pointed out, is in the unique position of being a 'constant consumer' in that he experiences the instructor's best teaching performances as well as those which are not so good and his strong subjects as well as his weaker ones. Moreover, pupil impressions are the product of many lessons rather than of the isolated few on the

basis of which supervisory ratings are usually made. The student rater does not rate in terms of the rather false and sometimes tense lesson taught in the presence of a supervisor, and what is more important, he knows how his classmates generally conduct themselves; whereas, the supervisor can assess only reactions made in the presence of a classroom visitor, himself. Another important argument in favor of pupil participation in the evaluation of teaching is that this is one of the few evaluative techniques which avoids the solitary rating so frequently condemned. (Vanderwerf, 1956, p. 81) Here, in fact, are many impressions and thus the opportunity for a more reliable assessment, providing of course that the students rate on approximately the same dimensions. As Guilford (1956) explains,

> averaging reduces the relative importance of errors, leaving relationships enhanced. (1956, p. 459)

A number of investigators have contributed to the establishment of the reliability of student evaluations of teaching. Guthrie (1927), for example, reported a reliability coefficient of .89 between ratings over an interval of a month. Knight (1928), Boardman (1930), Root (1931), Wilson (1932), and Bowman (1934) report reliability coefficients between .55 and .95.

In establishing the validity of student ratings, Davenport (1944) makes reference to Guilford's (1942) statement that,

> any test is valid for any sphere of behavior if it enables us to predict within that sphere, regardless of the name of the test or the supposed fundamental abilities that it measures. (1942, p. 285)

Davenport then argues that,

> since the sphere of behavior is pupil rating of teachers and the best prediction we can make is based on the obtained measurements, within the sphere, then surely it must follow that the pupil ratings are valid. (1944, p. 11)

Since the competency of the raters relates directly to both the reliability and the validity of their evaluations, Davenport seems quite justified in concluding that,

> from the studies thus far given it can be said with a fair degree of confidence that pupils are competent to rate teachers, [and] that their ratings are reliable and valid. (1944, p. 12)

Those who oppose student evaluation of teaching question the competence of the student-rater, pointing out that he is not trained to observe the important facets of the teaching process (this is perhaps the lack of bias valued by supporters of student rating), that he is unduly influenced by the degree of his own success, that the age

of the student affects his ability to rate, both younger and older students being less competent than the early adolescent, and that the student's sex may determine the favorability of his attitude towards either men or women teachers. Lehman (1927), for example, suspects that since good teaching involves success in stimulating student activity, indoctrination and coddling might well pass in the students' eyes for superior teaching. He states that

> the persuasion that teaching is best which pleases the majority of students is surely a most glowing example of a democratic fallacy. (1927, p. 466)

Also, student rating is reputed to be damaging to both teacher morale and student-teacher relationships.

Most of these charges have been investigated. The students' marks, for example, have been shown to bear no relationship to their evaluations of teaching in studies by Remmers (1930) and Bowman (1934). Rather than adverse effects, student evaluations have been reported to produce better teaching and increased teacher self-understanding. (Bowman, 1934; Ward, Remmers, and Schmalzried, 1941; Bryan, 1942; Amatora, Sister M., 1951; Savage, 1959.) Such factors as the age and sex of student-raters are more likely to affect ratings although to only a limited degree. (Davenport, 1944) Davenport suggests that factors such as hero

worship, latent homosexuality and design to escape the domination of the opposite sex might be operative and notes that students aged seventeen or eighteen make significantly lower ratings than others, perhaps because it is during these years that criticism and revolt are most commonly encountered. These effects are limited. This is pointed out in the following statement by Morsh and Wilder (1954) in reference to student factors such as class size, sex, age, intelligence quotient, and mental age.

> By and large the results of the various studies show that these factors have little bearing on student rating. (1954, p. 37).

It would appear that student rating is an evaluative technique which at least warrants continued investigation and it may well be that the student's continued association with the teacher makes him most sensitive to the criterial attributes of a good teaching performance.

Students do rate their instructors as indicated in a recent factor-analytic study of pupil attitudes towards teachers gauged by means of the semantic differential, (Hussek and Wittrock, 1962) in which the largest factor in the dimensions of attitudes towards teachers was found to be an evaluative one accounting for twenty-four per cent of the total variance and thirty-nine per

cent of the common variance[*]. The presence of construct validity in their judgments is indicated in Hussek and Wittrock's conclusion that

> those who rated school teachers as "good" also rated them as active and strong, creative, decisive, informed, witty, confident, cheerful, sociable, and sensible. (1962, p. 211)

Schmid (1961) subjected the data from several earlier studies to a uniform analysis to synthesize and interpret their seemingly profuse findings. He reports pupil-rating to be one of the two marked definers of factors, the other being pupil gain. The fact that pupils _do_ rate teachers is further evidenced in the findings of Cotsonas and Kaiser (1962) who report similar findings.

III. CORRELATION OF STUDENT EVALUATIONS WITH OTHER EVALUATIONS OF TEACHING

The pertinent findings regarding the efficiency with which students rate the teaching process are indeed diverse. In the following sections both supportive and non-supportive works are cited, the findings being ordered under the following criteria of teacher-effectiveness:

1. Pupil growth scores.
2. Supervisory ratings.

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[*] This is in line with Osgood's factoral position.

3. The accuracy of teacher perception of student-body opinion.

4. Student-rating of classroom interaction.

5. Teacher self-ratings.

1. The Relationship Between Student Ratings of Teaching and Pupil Growth Scores

Pupil growth is perhaps most widely recognized as a primary criterion of good teaching. It more closely approximates the 'ultimate criterion' (Thorndike, 1949) than probably any of the others.

> . . . a criterion is ultimate in the sense that we cannot look beyond it for any higher or further standard in terms of which to judge the outcomes of a particular personnel program. (1949, p. 121)

One must recognize, however, that even so, there are limitations. Pupil growth may not, for example, be entirely the product of teacher effect. Even though the more common complicating variables such as pupil intelligence and initial achievement be taken into account, the other factors remain uncontrolled. (Barr, 1961, p. 8) Some reside in the pupil in the form of general and specific abilities, previous training or motivation. A few such as socio-economic status, respect for education and assistance by family members can be attributed to the home

environment, and some lie in school and community, for example, morale,physical facilities, and other teachers. It is important to recognize also, that growth attributed to teacher-effect is not necessarily confined to the academic variety but extends to the development of personality, mental health, emotional maturity and aesthetic interests.

One of the more ambitious studies based on the pupil growth criterion is that by McCall (1952). Growth in social behaviour, creative composition, health, citizenship practices, and word knowledge as well as in the usual subject matter areas was measured, statistical corrections being applied to control the effects of class size and growth capacity. Each teacher was assigned a score based on the measured growth which had occurred in his classes during the school term. Although these growth scores were not found to relate significantly to any conventional measure of teacher effectiveness, the highest positive relationships were with pupil-evaluations of teaching and teacher self-ratings. The Lins (1946) study, a "global approach" to the development of teacher effectiveness criteria, employed supervisory ratings, pupil evaluation, and residual pupil gain (a quantity of pupil growth in excess of that predicted on the basis of the $_z$- scores for pre-achievement, mental age, and intelligence quotient) as

criteria on the basis of which effectiveness was determined and related to data acquired during teacher training. A multiple correlation of .60 for pupil evaluation with the remaining criteria testifies to the existence of a possible relationship between pupil growth and student evaluations of teaching. Boardman, (1930), having studied the responses of students in eighty-seven classrooms, reports that students rate most highly, those for whom they work hardest (r .73), those they like best (r..82), those having adequate discipline (r .75) and those from whom they judge that they learn most (r .89). These findings also seemingly lay the foundation for a relationship between student ratings of teaching and pupil growth scores. Similar findings by Guthrie (1953), and Keller and Clark (1954) show students to be making judgments on the basis of the teacher's ability to make material interesting, the clarity of his explanations, his interest in the class and in his subject, his efficient usage of class time, and his friendly and sympathetic attitude.

On the other hand, Schmid (1961) asserts that pupil gain bears no relationship to rating factors, after having employed factor-analytic techniques in a careful investigation of seven earlier studies which utilized among other ratings, those of students in rural one-room schools, in high schools and in junior-high schools. Jensen (1961),

in considering the four most capable and the four least capable teachers from each of three recent factor-analytic studies (Von Haden, 1946; Lins, 1946; Schwartz, 1950) notes regarding the data from the first mentioned, that

> the most interesting finding concerning the teachers selected on the pupil gain criterion is that those who produced greater pupil gains were not rated consistently superior to the low gain achieving teachers on the pupil evaluation criterion. (1961, p. 75)

In view of the diversity of findings, a further investigation of the relationship between pupil growth scores and their evaluations of teaching is warranted and would undoubtedly be facilitated by improved growth measures.

2. The Relationship Between Student Ratings and Supervisory Ratings of Teachers

A number of students report sizeable relationships between student ratings of teaching and those made by persons in supervisory positions. If these prove nothing more, at least they indicate that students appear to be capable of making judgments on dimensions similar to those employed by the individuals who are supposedly best qualified and thus have been given the prerogative to judge. The relationships found in a number of studies are set forth in the following table adapted from Morsh and Wilder (1954, p. 32).

TABLE I

CORRELATION OF STUDENT RATING WITH ADMINISTRATIVE RATING OF INSTRUCTOR EFFECTIVENESS

Author	No. of Teachers	Year	Level	Type of Relationship	Degree of Relationship
Knight	39	1922	elem. and high school	supervisory rating and student ranking	.74
Boardman	88	1928	high school	supervisory and student rankings	.56
Light	28	1930	high school	supervisory rating and student ranking	"close agreement"
Greene	32	1933	college	ratings by dean, peers, and students	All but 1 of dean's first 10 and 2 of peers' first 10 same as students' first 10
Bowman	30	1934	student	critic teachers' and student ratings	-.50 to .47
Starrak	entire faculty	1934	college	educational specialist and student graphic rating	75% of students showed close agreement; 25% divergence
Bryan	22	1937	senior high	administrative and student ratings	.36
	41		junior high	" " " "	.53
	22		senior high	" " " "	.36
	41		junior high	" " " "	.55
Brookover	33	1940	high school	supervisory and pupil ratings	-.08
	12		high school	av. 2 supervisory ratings and pupil ratings	.63
Ward, Remmers Schmalzreid	40	1941	student	supervisory and student ratings	.875
Porter	27	1942	student	supervisory and student ratings	"close agreement"
Brookover	66 all male	1945	high school	supervisory and student ratings	"slight positive relationship"
Von Haden	50	1946	high school	educational specialists' rating based on interview and autobiography and student ranking	none of 27 r's significant at .01 level. Range -.06 -.34
Lins	58 all female	1946	high school	composite supervisory rating and student ranking	.28

On surveying the existing relationships, it would seem that the correlations, though of varying sizes, are frequently positive and significant. On the basis of some findings, one would be apt to conclude that if supervisors rate accurately, then students tend also to rate in an accurate fashion. In other instances, when the variables appear independent, one would be forced to conclude that the judgments are quite independent and cannot be combined to form a valid composite estimate. Lins (1946), for example, employed three criteria of teacher effectiveness, supervisory ratings, pupil evaluation, and residual pupil gain, finding as noted by Barr, (1961) that

> some teachers were preferred by the administration, some were liked by the pupils and some taught in classes where there were substantial pupil gains . . . and generally speaking, these were not the same teachers. (1961, p. 17)

It is evident that there is, however, a trend towards agreement, albeit far from perfect, between pupil and supervisory ratings of teacher proficiency.

3. The Relationship Between Student Ratings of Teaching and Teacher Perception of Student Opinion.

The most frequently mentioned characteristic of the 'ideal' teacher is possibly the possession of a keen understanding of students. The earliest reported study of student

evaluations of teachers (Book, 1905) states that favorite teachers are patient, understanding, and interested in their students outside as well as within school. The latest factorial studies report similar findings. Cotsonas and Kaiser (1962), for example, in an analysis of a questionnaire developed on the basis of the comments of medical students on all phases of instruction, report an attitude factor and a teaching factor, the former being comprised of such characteristics as the teachers' sympathy towards students and his ability to gain their co-operation. This factor is said to represent an estimate of the teachers' ability to promote students' emotional and social security in the student-teacher relationship.

The most salient study of the relationship between pupil ratings of teaching and teacher perception of student body attitudes is that by Gage and Suci (1951), who found a significant relationship between the degree to which high school teachers were able to estimate percentages of various student responses to a number of controversial questions, and the 'positive affect' elicited by these same teachers in the student body. The authors explain this relationship as a function of the extent to which a teacher "values" his students and his relationship with them. In Brunerian terms, the "valued" student is viewed as an accentuated part of the teacher's perceptual field and all the associated factors

(for example, student opinion) thus receive emphasis also. In a later work Gage (1953) is more explicit about this relationship:

> Increased understanding of the functional role of perception leads us more and more to the conclusion that we can perceive others' opinions and attitudes more accurately because we have need to do so arising from a need to interact with others more effectively. (1953, p. 18)

A further attempt to analyze the relationship between teacher understanding of pupils and the favorability with which students regard these teachers (Gage, Leavitt, and Stone, 1955) was made by calculating the accuracy of teacher perceptions of the cognitive, social and emotional characteristics of upper-elementary school children by means of comparing teacher predictions of achievement, sociometric choice status, and a questionnaire designed to explore the emotional characteristics of the students, and factor analyzing pupil responses to questions pertaining to each of these areas. It was found that pupil responses to these questions failed to indicate the area or areas of teacher strength of understanding, one factor, a general favorability dimension, accounting for over sixty per cent of the total common variance. It was noted, however, that fourth grade teachers predict more accurately the cognitive skills of students; whereas, fifth and sixth

grade teachers have more accurate impressions of the social characteristics of their students. The latter finding is contrary to that of Bonney (1947) who reports that teachers of older children are less able to make estimates of pupil sociometric status than teachers of younger children, and also contrary to that of Ausubel, Schiff, and Gasser (1952) who cite a similar trend to that reported by Bonney.

Much of the current research on leadership[☆] leads one to conclude that, as in the case of the Gage findings, the more successful leader (here, the teacher) is better able to predict the feelings and consequent action of group members and can, as a result, accordingly adjust his own behavior to produce harmony and efficiency within the group and at the same time direct positive affect towards himself.

There is, however, a contradictory point of view which must also be given consideration. As Steiner (1955) relates, there are limitations on the degree to which such leadership techniques will function. He questions the extent to which any individual who perceives the roles of others is free to alter his own actions accordingly, and,

---

[☆] Leadership is a tricky concept to conjunctivize and the trait approach to its analysis has been largely discarded by professional social scientists. (Lang and Lang, 1961, p. 231)

in addition he asserts that a large portion of group interaction occurs in systems wherein the intentions and preferences of the individual are irrelevant, since his desire to act on them is so severely restricted, as in the case of a military group or a large company. Within such an organization, it is more important for the leader to perceive correctly the steps in the heirarchy and act in accordance with them. The individual group member need not make inferences about the strategies of others but rather, he must execute the behavior situationally appropriate to his own category and planned to be in keeping with that of other related categories. This is not totally inapplicable to the classroom situation,for is it not possible that in his zeal to accommodate the idiosyncracies of a number of individual students, a teacher might alter his instruction so as to make it of less value to the student body as a whole?

Within situational limits, it might be said that increased accuracy of social perception may be conducive to improved group relationships; however, it is possible that accurate leader-perception of the feelings and attitudes of others and the favorable impressions individuals have of those who accurately perceive are both the products of another influence.

4. The Relationship Between Student Ratings of Classroom Interaction and of Teaching.

As Evans (1959) has observed in the research on teacher effectiveness, the

> . . . reviews show that since 1931 there has been an interesting shift of emphasis from a pre-occupation with the importance of qualities such as intelligence, scholarship and professional knowledge to more descriptive studies of the teacher's personality and relationships between pupils and teachers. (1959, p. 22)

It has been recognized that the classroom is, in a sense, a small community, the functioning of which should be considered in estimating the effectiveness of a teacher and that, as Grim and Hoyt (1952) explain, the psychological state of the pupil can be viewed as a cluster of intervening variables (attitudes, feelings, and emotions) between S (instructional materials) and R (teacher approved behavior). The teacher must create the state of mild tension in which the student attempts to make the material he studies a meaningful part of his own experience, this state being an aspect of interpersonal relations. Grim and Hoyt describe the development of an inventory based on student reaction to classroom experience which attempts to gauge such aspects of teacher-pupil interaction as quality of classroom government, the clarity of objectives, the degree of co-operation, the incentive quality, the motivational intensity, provision

for student psychological needs and individualization of instruction, all of which are important in the classroom but exceedingly difficult to measure. It is thus indicated that differentiation might be made among at least several degrees of teacher competency, Factor analysis, in a later study, (Grim et al, 1954), disclosed two factors in the inventory, one relating to the pupil's self-direction towards personalized goals and the other relating to his feeling of acceptance by adults.

Few investigators have explored the relationship between pupil ratings of teacher-pupil interaction and pupil ratings of teacher effectiveness. Drawthorne (1954) did attempt such an inquiry. Students rated interaction between themselves and student-teachers by means of an instrument devised by the author, whereas, teacher effectiveness was rated on a modified form of Bryan's scale. Drawthorne reports a reasonably high degree of correlation (.557) between the two ratings. One would, however, expect that students might have difficulty in disengaging their impressions of classroom interaction from those of teacher effectiveness, since surely the latter is somewhat dependent on the former. A similar study by Brookover (1940) reports a correlation of .639 between pupil ratings of interaction and their ratings of teacher efficiency.

The study of teacher-pupil interaction by means of pupil responses has been further pursued in a recent work by Gold (1962). Teachers revealing a dominative as contrasted with a socially integrative pattern of thinking, (measured by means of the F scale, some of the items of which are from the M.M.P.I.) were found to have in their classes significantly more isolates, this term being applied to individuals allotted this status by the group despite their verified wishes for association. The isolate does not enjoy the optimum learning environment which a "quality educational program" might provide; therefore, his presence in the classroom provides an additional dimension to be considered in the evaluation of teacher effectiveness.

Earlier studies by Anderson (1939), (1943), Anderson and Brewer (1945), (1946), Anderson, Brewer, and Reed (1946), Thelen (1957), 1959), Cogan (1956), and Flanders (1958), (1959), (1960), (1961a) and 1961b) lend support to Gold's findings. Anderson and his colleagues began the systematic exploration of teacher-pupil contacts, contrasting socially integrative behavior and dominative behavior. The former is a term

> . . . applied to responses characterized by flexibility, and to behavior which attempts to bring out differences in others [and] to find common purposes among the differences. (1943, p. 561)

The latter, by contrast, is behavior

> . . . characterized by a rigidity or inflexibility of purpose. . . . One attempts to make others behave according to one's own standards or purposes. . . . It tends to obstruct the spontaneous behavior of another. (Anderson and Brewer, 1945, p. 9)

The consensus of the studies listed is that pupils in the classes of teachers who would be classed as generally behaving in an 'integrative' fashion were more spontaneous, revealed greater initiative, made more contributions voluntarily and were less frequently in conflict or bored. Cogan (1956, p. 339) for example, is able to produce evidence of a positive correlation between pupil performance in required work and integrative teacher behavior. In his later work, Flanders (1958) (1959) (1961b) makes explanation of a system whereby he analyzes classroom interaction, classifying verbal exchange as indirect (integrative) teacher influence, direct (dominative) teacher influence, indirect (initiation) pupil influence, or direct (response) pupil influence, reserving a category for silence or confusion. He observes, as a result of his analysis, that pupils learn more within and have more favorable attitudes toward classroom situations in which they are permitted to express their own ideas and feelings, and take an active part in the initiation of classroom activity and discussion. This might, of

course, vary with the age of the student and the particular subject matter area.

The exploration of classroom interaction is possibly one of the most promising avenues to an understanding of teacher effectiveness, but it is complicated with a maze of interrelated and often carelessly assigned personality traits, few of which can be effectively measured, but many of which are considered to be important attributes of the effective teacher.

5. The Relationship Between Student Ratings of Teacher Proficiency and Self-Ratings of Teacher Proficiency.

Upon first considering self-ratings of teacher efficiency or effectiveness, one might be of the opinion that the teacher himself should be best able to understand and explain his own actions. He is, however, seldom requested to evaluate himself. Even if we do not agree with Freud's extreme dictum that all autobiographies are lies, we must admit that self-evaluations by teachers are open to all the usual limitations attributed introspections. (Watson, 1930, p. 39) This concession, that the teacher may be inaccurate in his evaluation, assumes even greater importance when one faces the consideration that advancement or commendation may be dependent on such rating procedures.

Few studies, as a consequence, involve self-ratings or recognize them as being of any importance in evaluating teacher performance. McCall (1952) employs self-ratings, finding them, along with pupil evaluations to be the measures most highly, though not significantly, related to pupil growth scores. Webb and Nolan (1955) also report a relationship between self-ratings of teacher proficiency and those by students, (r .62), fifty-one instructors having been rated on the same scale, by students, by supervisors, and by themselves. Davenport (1944), by contrast, obtained a low correlation between teachers' self-ratings and pupils' ratings of teaching on comparable scales. He suggests, as is probably true, that a teacher's actual teaching might well differ from her philosophy of education because classroom factors force compromise.

Additional references to self-ratings have not been located. The conclusion must therefore be, from the point of view of the researcher and psychologist, and on the basis of the reviewed studies, that these ratings may have some value, in that some of them are correlated with and thus support student evaluation of teaching performance.

6. Summary

On the basis of the previously mentioned studies, the following tentative conclusion is in order: in addition

to face validity, pupil evaluations of teaching appear to possess sufficient merit to warrant their further investigation. They have been shown in some cases to relate to pupil growth scores, supervisory ratings, teacher perception of student-body opinion, pupil-rating of classroom interaction and, even in certain instances, to self-ratings of teachers. However, the occasional negative findings reinforce the necessity for additional research into the diversions of pupil assessments before more contradictory results further embarrass the professional researcher. This line of attack should be coupled with systematic investigation of the state of the relationships among other important criterion variables. The results of such an investigation carried out in this province appear in Table II.

IV. DEVELOPMENT OF HYPOTHESES

The dimensions of student response to the stimuli of the classroom environment are subject to investigation in this study. As Osgood, Suci, and Tannenbaum (1957) have demonstrated, the predominant attitude towards environmental input is an evaluative one. In Gombrich's (1960) more concise phrasing, it is suggested that evaluative reactions

> . . . testify to the constant scrutiny with which we scan our environment with one vital question--are you friendly or hostile, a 'good thing' or a 'bad thing'? (1960, p. 232)

TABLE II

CONTINGENCY COEFFICIENTS AMONG VARIOUS CRITERIAL INDICES OF TEACHING PROFICIENCY

Pupil	AB	Sup.	Pr. T	Univ. Av.
Pupil	.59**	.33*	.40**	.24
AB		.33*	.18	.17
Sup.			.21	.15
Pr. T				.15

Pr. T = Practice teaching marks given to the students while they were in training in the Faculty of Education in Edmonton, (1958-1959).

Univ. Av. = Average mark in all other courses in the Faculty of Education in 1958-1959.

AB = In the field ratings by Anderson-Black-Buxton in the spring, 1960, after the students had almost completed one year of teaching.

Pupil = Questionnaire ratings by students of these teachers (grades 4-9) gathered by Anderson-Black-Buxton during their visit to the teacher and obtained while the teacher was outside the room.

Sup. = Superintendents' estimates gathered in the spring-summer of 1960.

*significant at the .05 level of confidence.

**significant at the .01 level of confidence.

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1. Reproduced from Anderson, C. C., (1962)

In evaluating input, an individual must focus on certain cues (Berelyne's stimulus selection). These cues are therefore of immediate concern in any investigation of student evaluation of teaching. To what cues does the student attend?

The findings of early as well as more recent studies seem to indicate that students are keenly aware of sincere, understanding, and responsive behavior on the part of the teacher. Cotsonas and Kaiser (1962), for example, report an attitude factor in student responses which is said to measure affect, while the work by Gage and his associates leads to similar conclusions, Gage and Suci (1951) having used such affect as an experimental variable as did Gage, Leavitt, and Stone (1955). Flanders (1958), (1959), 1961b) systematically studies teacher-pupil relationships and lends further evidence in this direction, as does Gold (1962) who finds the classroom isolate more prevalent in the classrooms of more authoritarian (and thus less responsive and understanding) teachers.

One might then, expect student responses to questions pertaining to classroom proceedings and their own related attitudes to reveal awareness of and concern with teacher-pupil rapport, particularly in terms of

student freedom to actively participate in classroom activity and discussion. Attitudes towards such freedom might be expected to be generally favorable since pupil participation is one of the marks of a classroom in which the teacher reveals concern with the individual student and understanding of his needs.

By contrast, students might also be expected to perceive and respond to disciplinary or restrictive aspects of the classroom. Just as he is aware of his freedom to participate, so also the child may be aware of constraining factors in his environment. Up until the time of school entrance he plays freely, his activity being, in contrast to the formal school atmosphere, relatively free of restrictions and controls. On his arrival at school, however, he becomes subject to many, perhaps disturbing, restrictions. He is to be in attendance during particular hours, he may not speak aloud when he so wishes, he must take turns and he is expected to follow instructions, doing what he is told to when he is told to do it. These controls are to varying degrees new and demanding, depending on the extent to which parents have imposed similar restrictions. Constraint grows more severe as the child advances in school, the lower grades being characterized by somewhat greater freedom than upper ones. Both at home and at school,

disciplinary measures serve as directives towards what is considered desirable behavior. The child is punished for perhaps being untidy or unduly bold; whereas, he is rewarded for the exhibition of such behavioral characteristics as politeness or kindness.

The control of behavior by means of punishment and reward or approval and disapproval can be explained in terms of arousal induction and reduction. As Berelyne (1960) relates, the individual is constantly seeking the steady state of optimal arousal (pp. 200-209), significant departure from which represents 'unpleasure'. This sought after balance, however, is constantly disturbed by both external and internal cues. Significant others, in an effort to produce certain behavior, induce arousal in various ways and set up corresponding incentives, the reaching of which by means of desirable behavior, may reduce it. A parent or teacher, for example, may make it apparent that his approval will be forthcoming only in response to good grades, (the incentive). For the child, the threat of loss of approval is arousal-inducing, and he therefore directs his energies to the attainment of good grades which will supply a reduction of arousal. A working habit is thus established.

Similar explanations of the establishment of behavioral patterns through punishment and reward or the

anticipation of either have been made by others. (Mowrer, 1950; Davis, 1948; McClelland, 1961).

Mowrer, clearly borrowing from Freud, establishes anxiety reduction as a reinforcer of learning. Freud labelled as "signal anxiety" that produced when

> . . . the young child learns to anticipate the advent of a traumatic situation and to react to it with anxiety before it becomes traumatic. . . . It is produced by a situation of danger or the anticipation of danger. (Quoted from Brenner, 1955, pp. 82-83)

The avoidance of noxious stimuli provides escape from a secondary form of noxious stimulation, fear. As Anderson (1961) explains,

> . . . anxiety is associated with significantly high arousal or with the expectancy of that arousal. The deep and intense expectation termed 'signal anxiety' motivates the individual to respond suitably to cues premonitory of the noxious stimulus. (1961, p. 151)

Mowrer (1960, pp. 135-136) later expanded his theory so as to include, not only fear but also hope, both under the principle of suggestion, respectively, negative, and positive. He is thus able to explain learning apart from its direct dependence on the satisfaction of organic needs, and envision its occurring so as to avoid ridicule or gain approval, this being in harmony with the basic tenets of Berelyne's theorizing.

Davis (1948) also elaborates on the force of socialized anxiety as a motivational device, commenting on the differences between what the middle-class individual and what the lower class in individual define as "pleasant" or "painful." Although

> . . . the middle-class child learns a socially adaptive fear of receiving poor grades in school, of being aggressive toward the teacher, of fighting, of cursing, and of having early sex relations while the slum-class child learns to fear quite different social acts, (1948, p. 30)[*]

it is fear which is at the root of action, as Mowrer explains.

In his latest work McClelland (1961) summarizing his earlier work, explains the motivational effects of n-achievement, also a form of anxiety, on economic development and more particularly on the individual who seeks to achieve in order to comply with the dictates of society, thereby reducing the arousal induced by the possibility of having none of the status associated with certain occupations and income levels.

Even Hull's (1952) concept of reinforcement in terms of drive-stimulus reduction is best explained in Berelyne's terms as Berelyne himself allows (1960, p. 167) and Osgood accepts (1957, p. 369).

In addition to concern with teacher-pupil rapport and freedom to participate in classroom activity, in any

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[*] It should be noted that the congruence of Davis' and Berelyne's thinking does not depend on the socio-economic variable here involved.

accumulation of pupil impressions of proceedings about them there will be, it is expected, evidence of response to the restrictive or disciplinary aspects of the situation.

Assuming that the relationships between criterion variables is disappointingly negligible, the following hypotheses are developed with respect to the dimensions of student responses to classroom events: that factor analysis will reveal

1. a factor describing the extent of student participation in classroom activity, and
2. a factor describing student awareness and concern with the disciplinary and restrictive facets of the classroom.
3. A third hypothesis, or rather likely experimental possibility would be concerned with the possibility of developmental changes in the strength and incidence of these factors.

CHAPTER III

THE EXPERIMENTAL DESIGN

This study involves factor-analysis of student responses to a number of questions concerning classroom procedures and events and related pupil attitudes. The testing was done as part of a larger teacher-evaluation program carried out in the spring of 1960 by members of the Faculty of Education of the University of Alberta in visits to the classrooms of teachers who had been in the previous year's Junior Elementary and Intermediate Program for teacher training.

I. THE INSTRUMENT

Twenty questions regarding classroom activity, impressions of classroom interaction and interpersonal relationships, and attitudes towards work and attendance comprise the instrument used in this investigation. An additional item has been added to take into account the sex of the student responding. An attempt to classify the included items is reported in Table III, though the analysis is indeed superficial and there is a good deal of overlapping as well as cause and effect interaction within the responses, individual attitudes, for example, being perhaps a product of both teacher-pupil interaction

TABLE III

CLASSIFICATION OF QUESTIONNAIRE ITEMS

Area Explored by Item	Item Number (s)	Total
1. Classroom procedures	6, 9, 14, 15, 17, 19	7
2. Teacher-student interaction	4, 5, 12, 13	4
3. Student-student interaction	2	1
4. Individual attitudes	3, 7, 8, 10, 11, 16, 18, 20	8
5. Other	1	1
		21

and classroom proceedings. Each item was answered either 'yes' or 'no'; however, if the student was uncertain of his answer he could also indicate this. A copy of the questionnaire appears in Appendix A.

II. THE SAMPLE

The sample of respondents in this study included Alberta students from Grades III to IX inclusive, all of whom were in the classrooms of teachers who had been part of the Junior Elementary and Intermediate classes in the Faculty of Education at the University of Alberta in the 1958-1959 winter session. The classrooms visited, apart from those in the city of Edmonton and immediate vicinity, were within a day's journey of this city, with the exception of a number of classes in the Spirit River - Bonneyville area. Table IV indicates the number of classrooms included as well as their locations. The accompanying map shows their geographic locations. (Figure 1)

Although one hundred classrooms made up the original sample the present study is confined to seventy-seven of these. Grade I and II classes have been excluded because of their inability to read the questionnaire. A number of multiple-grade classrooms have also been excluded in that they could not be included in either the

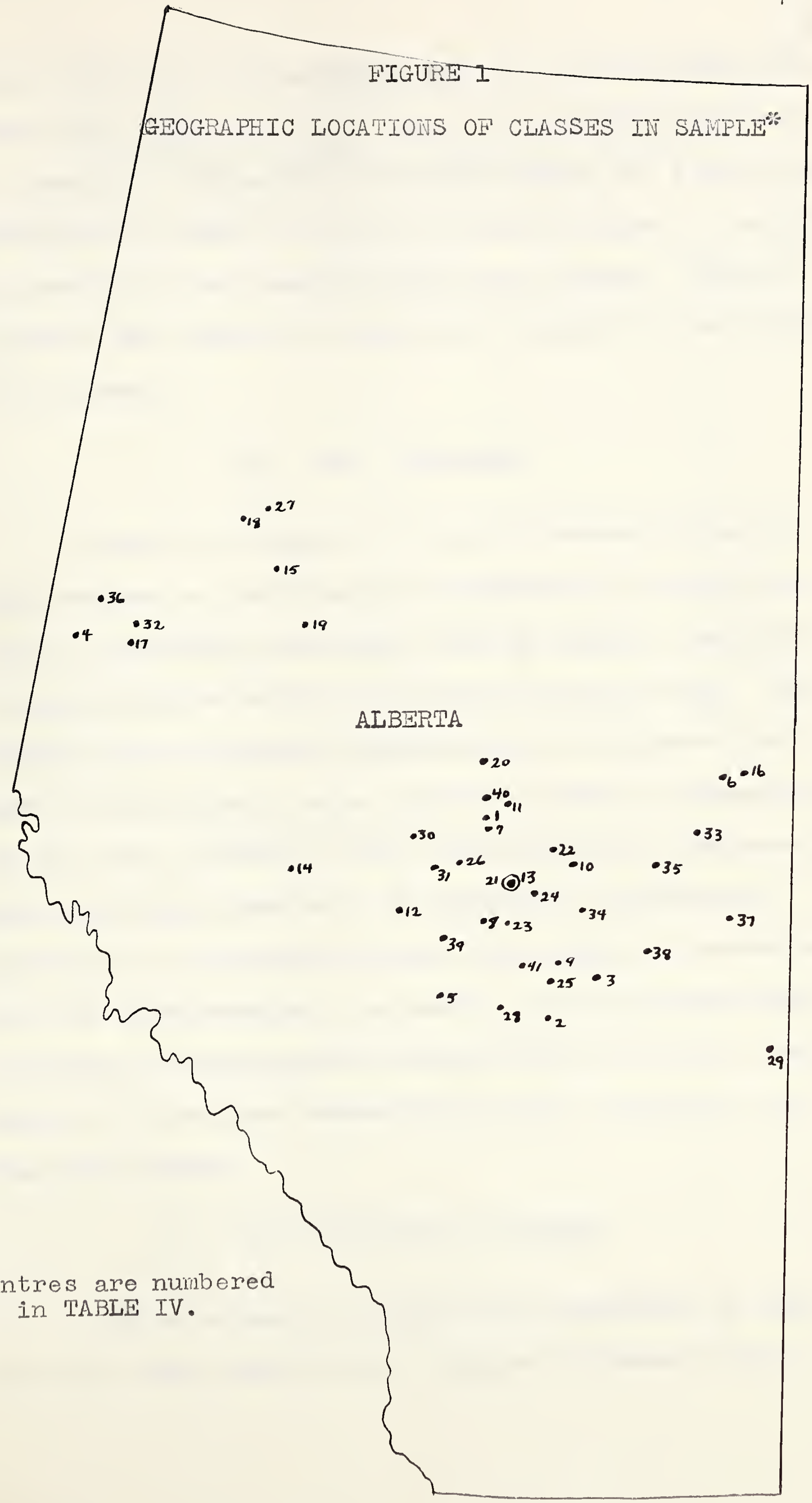
TABLE IV

NUMBER AND LOCATION OF CLASSES IN SAMPLE

Centre	No. of Classes	Centre	No. of Classes
1. Advance	1	21. Jasper Place	1
2. Bashaw	1	22. Lamont	1
3. Bawlf	1	23. Leduc	1
4. Beaverlodge	2	24. Ministik	1
5. Bluffton	2	25. New Norway	2
6. Bonneyville	2	26. Onoway	1
7. Busby	1	27. Peace River	2
8. Calmar	1	28. Ponoka	1
9. Camrose	1	29. Provost	1
10. Chipman	1	30. Sangudo	1
11. Clyde	1	31. Seba Beach	1
12. Drayton Valley	1	32. Sexsmith	1
13. Edmonton	26	33. St. Paul	1
14. Edson	3	34. Tofield	1
15. Fahler	1	35. Two Hills	2
16. Fort Kent	1	36. Valhalla	1
17. Grande Prairie	3	37. Vermilion	1
18. Grimshaw	1	38. Viking	1
19. High Prairie	1	39. Warburg	1
20. Jarvie	1	40. Westlock	2
		41. Wetaskiwin	1
		Total	77

FIGURE 1

GEOGRAPHIC LOCATIONS OF CLASSES IN SAMPLE*



* Centres are numbered as in TABLE IV.

first sub-group, Grades IV, V, and VI, or the second one, Grades VII, VIII, and IX (a Grade VI and VII classroom, for example). The majority of the classes are single grade groups but in order to include a greater number of responses, the previously mentioned grouping was planned. Table V indicates the number of classes and students in each grade and sub-group.

III. THE PROCEDURE

Each of the pupils in the classrooms visited by staff members of the Faculty of Education in connection with the previously mentioned testing program, completed the questionnaire which is the basis of this study. The students did not identify themselves, an anonymous response being assumed a more truthful record of impressions, nor were the teachers in the classrooms while the questionnaire was being answered. No additional information regarding the individual student was sought in connection with the questionnaire, the entire classroom group being considered an independent average measure of pupil observations of classroom proceedings, pupil attitudes, and classroom rapport.

IV. THE STATISTICAL ANALYSIS

In an attempt to support the hypotheses of this study the data collected was analyzed by means of the

TABLE V

THE SAMPLE: NUMBER OF CLASSES AND STUDENTS BY GRADES OR GRADE GROUPINGS

Grade or Group	Number of Classes	Number of Students
3	3	69
4	12	315
5	15	476
6	6	214
7	8	226
8	8	249
9	4	114
4, 5, 6	17	309
7, 8, 9	5	51
	Total 77	Total 2,023

following procedures each of which is described in the order of its application.

1. Scoring Procedure

Each of the twenty-one questionnaire items was answered 'yes', 'no', or '?'; however, answers of the third variety were, in scoring, recorded as negative on the assumption that, since questions were by nature straight-forward and definitive, uncertainty indicated unwillingness to testify to the teacher's not having instituted desirable procedures, or reluctance to reveal one's own shortcomings. Uncertain answers were relatively few in number, there being on the average only three or four on a questionnaire.

2. Phi Coefficient Calculations

The previously described scoring procedure, a dichotomous treatment of each variable (question) made possible the use of the phi coefficient (Walker and Lev, 1954, pp. 272-273) in determining within the total group and each grade and sub-group the extent of intercorrelation among the items; that is, a correlation coefficient for each item with each other item for each of the groups was calculated.

3. Factor Analysis and Rotation of Factors

In an effort to determine whether the variations revealed in twenty-one responses could be accounted for in terms of fewer categories or whether there were, in effect, fewer but more fundamental underlying sources of variation operating in the scores, the intercorrelations obtained by means of the phi coefficient were factor analyzed. The principal axes method (Harman, 1960, pp. 185-191), which maximizes the variance accounted for by each factor, was employed. The factors having been isolated by means of an eigenvalue-eigenvector solution, the axes were then rotated to permit useful psychological interpretation of these factors, this being accomplished so as to approach Thurstone's simple structure criteria (Ibid., pp. 109-110)

4. Comparing Factors

In each group, factors with eigenvalues in excess of one were isolated and studied with reference to the items from the questionnaire which contributed most to them. On this basis, these factors were matched with similar ones from other groups. In order to determine the degree of relationship among the matched factors, Tucker's coefficient of congruence (Harman, 1960, pp. 257-259) was

utilized and as a result, a series of "correlational" matrices produced, these indicating the degree of relationship between each factor in each grade or group and the most similar one in each other grade or group.

CHAPTER IV

THE FINDINGS

The findings of the study are herein considered, some of the intermediate results being reported prior to the final ones in that they permit a clearer explanation of the latter.

I. CORRELATION MATRICES

To determine the dimensions of pupil response, matrices consisting of the intercorrelations[☆] among the responses to the items of the questionnaire were set up for the total group and for each grade and sub-group. These matrices for the total group, for each of the grades three to nine inclusive and for each of two sub-groups are set forth in this order in Tables I to X of Appendix B.

The absence of large correlations indicates that each question is to a considerable degree independent; however, the presence of lesser ones prompts a search for more basic dimensions in terms of which the students respond.

[☆] Phi coefficients were used for this purpose since each questionnaire item can be considered a dichotomous variable in that, as answered here, a response positions the individual in one of two possible groups.

Factor analysis was the obvious statistical technique to use because, as Fruchter (1954) has indicated, its purpose is to reduce a multi-factor confusion to some more parsimonious order. It is

> a method of analyzing a set of observations from their intercorrelations to determine whether the variations represented can be a accounted for adequately by a number of basic categories smaller than that with which the investigation was started. (1954, p. 1)

II. THE PRINCIPAL COMPONENTS METHOD OF ANALYSIS

The principal components method of analysis, that employed in this study, is such that the factors are represented by the principal axes of ellipsoids formed through the plotting of scores on the individual variables. The first principal factor accounts for the maximum possible variance, each successive one accounting for a maximum of the then existing residual variance. A unique mathematical solution for a given correlational matrix is thus produced and the initial correlation matrix reduced to the smallest number of orthogonal factors (the variables are described in terms of uncorrelated common factors).

In the course of this analysis, a number of solutions to an nth degree polynomial equation are sought,

each designated an eigenvalue for which there is a corresponding eigenvector. The factors of the original correlation matrices are represented by the product of each eigenvector and the square of the corresponding eigenvalue, the number of factors obtained being as a consequence equal to the number of variables. Since a relatively small number of the factors obtained taken together account for the greater portion of the variance, only these are interpreted.

The unrotated factor loadings for each item on each factor having an eigenvalue in excess of one were assembled and rotated.

III. VARIMAX ROTATION

As Harman (1960) explains,

> the principal-factor solution is usually employed only as a "stepping stone" to a "more desirable" multi-factor solution obtained by transformation of the preliminary solution. (1960, p. 111)

Attempts to develop a scheme by which such a transformation could be best accomplished were spearheaded by Thurstone in his development of the principle of "simple structure" as an avenue to the most satisfactory psychological interpretation of factors. In general, the rotation of axes is carried out to reduce the complexity

of variables, the ultimate objective being the practically impossible uni-factor solution towards which the principles of simple structure are directed. It has since been suggested that the fundamental basis of rotation of factors is the achievement of parsimony in the solution, this being thought of as

> . . . the position of the configuration of an hypothetical continuum of all possible configurations from the completely chaotic to the ideal configuration in which each variable is of unit complexity. (Harman, 1960, p. 292)

Varimax rotation, which attempts to simplify the columns of a factor matrix in order to meet the requirements of simple structure (Kaiser, 1958) was employed to permit the best interpretation of the factors located in this study. Kaiser has found that this method of rotation has an "invariance property," that is, the factorial description of a test developed using this technique remains to a large extent invariant when the test is moved to another battery containing the same common factors. He proposes (1958, p. 195) that the ultimate objective of the rotation problem is factorial invariance, an alternative to and possible improvement on simple structure.

Rotated-factor matrices for the total sample, Grades III to IX inclusive, and each of two sub-groups

appear in this order in Tables I to X of Appendix C, with accompanying transformation matrices.

IV. INTERPRETATION OF FACTORS

In each rotated-factor matrix, items having factor loadings in excess of .4 were noted and the character of particular factors established in accordance with their presence and relatedness. For example, in the total group rotated-factor matrix (Appendix B, Table XI), items 8, 11, 16, 18, and 20 have loadings in excess of .4. In order of the size of these loadings and thus the contribution of the particular item to the factor, these items are:

8. Do you like to be in this class?
18. Are you proud to be in this class?
11. Do you have much fun in this class?
20. Do you always do your best in this class?
16. Do you learn a lot in this class?

The importance of these items indicates that this factor represents a dimension of general satisfaction. Each factor in each of the ten matrices was analyzed in this fashion, and on the basis of such interpretation, matched with those judged to be most similar in other groups. In order to facilitate computation and avoid overlapping of information, factors from the multiple grade groupings

were not included in this matching since these grades were represented individually in the single grade groups.

Five factors were cited as being relatively constant throughout all or most of the groups. In order to discover the extent to which these factors are, in fact, similar from grade to grade, Tucker's coefficient of congruence (supra., p. 52) was applied to the matched factors and the relationship between each one and any other ascertained. Each of the five factors is discussed in turn in succeeding sections, the coefficients of congruence being included therein. In addition, each section contains, for comparative purposes, a Table made up of the factors chosen from the various groups as representing the particular dimension involved. (Tables VII, IX, XI, XIII, and XV)

Factor I

In the total sample as well as in each of the grades, a "general satisfaction" factor such as that described in the previous example was apparent. Indicative of satisfaction with the class and with the teacher, this factor accounted for the greatest portion of the variance in four of eight groups, the second greatest portion in three groups, and the third largest portion

in the remaining single group. The following items, all of which had loadings in excess of .4 on this factor in five or more of the eight groups compared, serve to frame its description:

8. Do you like to be in this class? (.73)
11. Do you have much fun in this class? (.62)
16. Do you learn a lot in this class? (.60)
18. Are you proud to be in this class? (.69)
21. Do most of the pupils like the teacher? (.60)[☆]

Marked by approval of the group and its activities and by the individual's own pleasure at participating therein, this factor, an indication of positive affect, might well be compared with the latter of two dimensions advanced by Foa (1961) as basic to the structure of interpersonal relations, these being dominance-submission and love-hostility. The response in this instance is in the direction of the portion of the continuum labelled "love." The factor resembles also what Lawrence (1961, p. 196) refers to as spontaneous, informal group structure, and

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[☆] In parentheses following each item in the description of this and each of four succeeding factors is the loading of the particular item on the involved factor from the total group analysis.

Anderson (1939) labels as socially-integrative as contrasted with dominative behavior.

For comparative purposes, the factors drawn from the various groups and assembled to represent such positive affect are set forth in Table VI. The application of Tucker's coefficient of congruency (supra., p. 52) permits comparison of this factor in one group with matched ones in other groups. These coefficients, most of which are in excess of .8, are set forth in Table VII and serve to illustrate the relative invariance of the factor from group to group.

The factor in Grade III which most nearly approximates general satisfaction is somewhat different from the others, being largely devoted to a liking for the teacher and indicating relatively little response toward the group. Greater importance is attached, instead, to the individual's doing his best work in class, this being evidence, perhaps, of his desire to please the teacher and further strengthen the emphasized individual rather than group relationship. Hence, the relationships between this factor and each of the others are of a lower order.

It is interesting to note that item number eighteen, which reflects the pupil's pride in being in his class, has

TABLE VI

FACTOR I: PUPIL SATISFACTION IN VARIOUS GROUPS*

	Factor							
Item	T-1	3-2	4-2	5-1	6-3	7-1	8-1	9-1
1	-147	-113	059	-129	-013	-301	011	-056
2	201	065	267	197	392	-004	495	-081
3	006	052	073	-044	194	110	-039	025
4	-765	113	045	-095	026	-163	-008	223
5	-130	-018	-191	158	-273	-222	-036	150
6	079	-004	525	-066	-144	119	-011	047
7	-233	-123	-180	-165	-307	-285	-019	-090
8	731	156	504	704	623	737	711	823
9	040	-064	129	022	064	038	-071	-184
10	-059	-015	-082	-039	120	-170	029	117
11	617	284	081	641	616	613	523	800
12	082	-032	081	117	243	199	-022	-034
13	-122	-019	-057	-030	147	-058	-137	-221
14	-019	-099	-087	-198	150	005	033	150
15	186	033	147	004	132	355	124	302
16	599	200	510	313	702	696	501	389
17	105	028	-066	218	117	188	245	148
18	692	346	314	675	752	775	725	717
19	-039	121	-070	-157	091	-186	148	-069
20	199	688	-054	032	261	286	226	175
21	602	856	716	530	610	441	509	473
Sums of Squares	2.374	1.550	1.634	1.993	2.806	2.822	2.237	2.568

*Factor labelling - first number indicates group and second the number of the factor within the group.

Decimal points have been omitted from factor loadings.

TABLE VII

COEFFICIENTS OF CONGRUENCY AMONG FACTORS MATCHED AS MEASURING PUPIL SATISFACTION

Group	T	3	4	5	6	7	8	9
T	1.00							
3	.71	1.00						
4	.79	.58	1.00					
5	.93	.62	.66	1.00				
6	.93	.69	.72	.84	1.00			
7	.96	.63	.72	.86	.88	1.00		
8	.94	.68	.71	.89	.96	.86	1.00	
9	.89	.63	.60	.87	.80	.85	.86	1.00

the heaviest loading on the "satisfaction" factor in Grades VI, VII, and VIII, and close to the heaviest loading on the same factor in the Grade V analysis. This suggests an emphasis on group feelings and class spirit; whereas, younger students, (Grades III and IV in this study), tend to express to a greater extent, liking for the individual teacher.

Whether in terms of group or individual pupil-teacher interaction, the avenue of interpersonal relations is perhaps one of the most direct routes to an understanding of the teaching process and susequently its accurate evaluation.

> It is believed that the main influence of the teacher is manifest in the process of interacting with children. The use of materials of instruction, the development of units and projects, and the activities of the class are all conditioned by the attitudes of the teacher as he introduces the materials or activities and continues interaction with the children. The processes he uses, the functions he performs in relation to the children of his classroom determine their participation, the degree of choice that is theirs and even the mental processes they use in their work. In addition, the attitudes of the children towards one another and towards others, develop, to a large degree, in the framework of the teacher's treatment of individual children. (Smith, 1959, p. 9)

Factor II

A factor mirroring the restrictive or disciplinary aspects of the classroom is also apparent in each grade as well as in the total sample. This might be considered the second most important factor in this analysis, in that it accounts for the greatest amount of the variance in three of eight groups and the second greatest amount in the remaining five groups. In addition, it is of some interest to note that Jersild (1940), in his attempts to discover the characteristics of the best and least liked elementary school teachers, also reports the importance of a disciplinary dimension; the "qualities of performance as a disciplinarian" were those most frequently mentioned among the eight hundred ninety-seven students from Grades I to XII, and one hundred thirty-seven graduate students contacted in his study.

Each of the following items has a loading in excess of .4 on the factor chosen to represent the disciplinary dimension of student response in five or more of the eight groups studied, and is consequently of use in ascertaining the nature of the factor:

5. Do some of the pupils get scolded a lot? (.52)

[*]9. Do the pupils often make so much noise that it's hard to work? (.72)

[*]13. Do some of the pupils break class rules a lot? (.62)

17. Are the children usually quiet in your room? (.59)

19. Do the pupils ever waste time because they don't know what to do? (.54)

The type of restrictions most frequently associated with the classroom are apparent in these items. The problems of noise, time wastage, and keeping rules, along with the prevalence of teacher scolding all serve to create an image of the disciplinary facet of the typical classroom.

As in the previous instance, the factors chosen from the various groups as being representative of, in this case, discipline in the classroom, are set forth in tabular form. (Table VIII) The relationships between these factors (coefficients of congruency) appear in Table IX. The response in terms of classroom discipline, like that on the satisfaction dimension, appears to be to a considerable degree invariant. Twenty-three of twenty-eight coefficients of congruency are in excess of .70 and none is lower than .45.

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[*] Items 9 and 13 have the largest loadings on the "discipline" factor in 5 of 8 groups, item 9, itself, placing first in 6 groups.

TABLE VIII

FACTOR II: PUPIL RESPONSE TO CLASSROOM DISCIPLINE IN VARIOUS GROUPS*

Item	Factor							
	T-2	3-1	4-1	5-2	6-2	7-2	8-2	9-2
1	058	156	050	074	-036	076	045	093
2	-335	059	-216	-049	-435	-692	-142	-025
3	014	-021	036	-073	012	088	-005	-035
4	229	071	200	176	481	142	103	538
5	523	519	580	374	575	096	486	127
6	050	131	089	019	118	-047	129	007
7	143	197	201	102	103	006	040	170
8	-064	-138	076	-013	-163	-116	-067	009
9	719	450	648	743	769	401	742	757
10	100	327	049	118	111	-084	063	008
11	-011	115	083	-012	-015	-166	092	-037
12	047	-065	083	076	-070	-088	049	030
13	617	572	579	654	734	750	639	746
14	008	071	-006	111	110	-101	275	-070
15	-043	048	074	119	019	-349	069	-120
16	-035	-159	020	-096	158	011	-004	-284
17	-590	-276	-595	-062	-621	-678	-565	-468
18	-113	061	-127	-037	-167	-044	-153	-147
19	540	831	535	652	656	119	438	209
20	-064	031	-078	068	028	-247	-199	-006
21	-080	072	-072	-091	121	062	-079	494
Sums of Squares	2.044	1.840	1.925	1.674	2.869	1.975	1.925	2.092

*Factor labelling: first number indicates the group, and the second the number of the factor within the group.

Decimal points have been omitted from factor loadings.

TABLE IX

COEFFICIENTS OF CONGRUENCY AMONG FACTORS MATCHED AS MEASURING PUPIL RESPONSE TO DISCIPLINE

Group	T	3	4	5	6	7	8	9
T	1.00							
3	.84	1.00						
4	.98	.84	1.00					
5	.88	.89	.87	1.00				
6	.96	.81	.94	.85	1.00			
7	.78	.45	.84	.50	.75	1.00		
8	.95	.82	.95	.87	.92	.69	1.00	
9	.78	.65	.76	.73	.79	.66	.75	1.00

The remaining three factors, described in order of their importance in the total sample, are not so clearly defined as the first two, nor do all of them appear in all the grades.

Factor III

The third factor, which is observed in all but the Grade IX group, is best described as a participation factor. The following items serve to define it:

6. Do the pupils in your class usually work in groups? (.56)
14. Did the pupils make up the class rules they are supposed to obey? (.64)
15. Do you help plan what the class is going to do? (.66)

Tables X and XI are devoted respectively to the factors chosen from the various groups as representing a participation dimension and a matrix of congruency coefficients indicating the degree to which these factors are interrelated. The coefficients, it will be observed, are generally lower than those in the two previous congruency matrices, in excess of half of them being in the order of .5. No important trends have emerged.

TABLE X

FACTOR III: PUPIL PARTICIPATION IN VARIOUS GROUPS*

	Factor						
Item	T-3	3-5	4-4	5-6	6-4	7-3	8-4
1	056	-018	-166	092	-048	095	068
2	176	119	177	163	024	125	-342
3	057	-013	-058	-145	085	086	057
4	-106	-086	-110	-639	-046	-007	-049
5	-130	169	125	201	186	-533	-494
6	560	653	384	032	666	457	083
7	-140	-283	131	-078	-229	-053	-003
8	-005	-050	-023	-166	236	-068	100
9	047	140	-069	054	141	-159	-006
10	-069	069	050	-055	029	-043	042
11	122	-124	-068	017	370	-107	317
12	-020	070	001	-619	027	-106	-771
13	040	221	136	-135	048	078	106
14	644	799	707	709	519	773	413
15	657	162	735	-010	647	302	461
16	064	390	-095	105	-131	138	-060
17	175	-028	202	035	163	120	063
18	-043	-168	-087	-036	066	080	052
19	192	-060	083	-098	281	-010	072
20	099	-047	124	-028	063	-167	-207
21	132	-011	056	227	-145	286	-078
Sums of Squares	1.392	1.504	1.409	1.525	1.600	1.428	1.545

*Factor labelling: first number indicates group and second the number of the factor within the group.

Decimals have been omitted from factor loadings.

TABLE XI

COEFFICIENTS OF CONGRUENCY AMONG FACTORS MATCHED AS MEASURING PUPIL PARTICIPATION

Group	T	3	4	5	6	7	8
T	1.00						
3	.58	1.00					
4	.87	.49	1.00				
5	.40	.47	.40	1.00			
6	.85	.48	.76	.21	1.00		
7	.79	.59	.64	.41	.48	1.00	
8	.46	.06	.35	.38	.41	.44	1.00

Factor IV

A tendency to question the instruction offered by the school coupled with a desire to absent oneself from it, though not so well defined as any of the foregoing factors is, nevertheless, apparent in almost the entire sample. (This factor does not appear in the Grade III analysis). Items 7 and 10 describe this factor which, at the Grades IV and VI levels, is particularly associated with boys.

7. Do you ever feel like staying away from school? (.49)
10. Do you ever wonder why you have to do what you are doing in school? (.68)

Tables XII and XIII set forth respectively, the factors matched as representing this dimension and the coefficients of congruency between pairs of the chosen factors. Again the coefficients appear to be unlikely to reveal any significant developmental trends.

Factor V

An attempt was made to define a fifth dimension in terms of which pupils respond to classroom events. This factor occurs throughout the sample and relates to the individual's doing his best, or doing satisfactory

TABLE XII

FACTOR IV: QUESTIONING THE VALUE OF INSTRUCTION IN VARIOUS GROUPS*

	Factor							
Item	T-4	4-6	5-5	6-7	6-6	7-4	8-6	9-8
1	-121	571	131	-012	749	-101	-277	-065
2	392	-083	-035	155	-080	186	-083	032
3	-085	125	-065	-056	197	-069	-112	294
4	338	104	089	289	-366	091	735	-004
5	197	036	306	123	076	163	039	-175
6	-099	024	-011	-083	-028	389	-067	008
7	492	329	579	365	499	507	203	115
8	-088	-069	-047	235	061	-094	078	-013
9	064	060	088	105	-118	432	155	007
10	680	774	687	725	033	699	713	813
11	-016	035	-076	-042	036	-173	-113	069
12	040	011	-417	052	228	410	-007	228
13	031	-089	-090	-282	111	016	113	-085
14	-119	-013	-138	-301	-029	-080	-162	033
15	103	007	-009	225	-118	-068	025	263
16	-107	-275	-036	005	-260	-129	-072	-153
17	209	053	-040	-039	134	-051	041	-119
18	069	-082	-167	091	152	025	000	090
19	283	198	148	163	136	206	-104	144
20	-270	-195	-576	-122	-151	-157	-168	-263
21	-060	051	099	-311	-162	-062	134	-036
Sums of Squares	1.299	1.251	1.543	1.231	1.271	1.477	1.339	1.261

*Factor labelling: first number indicates the group and the second the number of the factor within the group.

Decimal points have been omitted from factor loadings.

TABLE XIII

COEFFICIENTS OF CONGRUENCY AMONG FACTORS MATCHED AS MEASURING PUPILS' QUESTIONING VALUE OF INSTRUCTION

Group	T	4	5	6-7	6-6	7	8	9
T	1.00							
4	.60	1.00						
5	.71	.71	1.00					
6-7	.79	.60	.63	1.00				
6-6	.13	.56	.87	.11	1.00			
7	.73	.57	.55	.57	.18	1.00		
8	.69	.44	.92	.65	.60	.55	1.00	
9	.60	.67	.47	.66	.76	.53	.49	1.00

work in class. Items 3 and 20 illustrate its content.

3. Is your work usually good enough? (.67)
20. Do you always do your best in this class? (.59)

This factor is particularly associated with girls in the total sample and to an even greater extent in Grades VIII and IX. (Item 1 defining sex has, on this factor in these groups, a negative value high enough to indicate its importance.) This is in accordance with what might be expected since it is particularly during the latter years of junior-high school, just prior to the permitted school leaving age, that many boys grow particularly discontented and careless.

The factors chosen from the various groups as representing this dimension are set forth in Table XIV and the matrix of congruency coefficients revealing their interrelationships produced in Table XV. The coefficients, like those for factors three and four, are of a lower order than those for factors one and two, and again, no important trends emerge.

TABLE XIV

FACTOR V: DOING SATISFACTORY WORK WITHIN VARIOUS GROUPS[*]

					Factor				
Item	T-5	3-6	4-3	5-8	6-5	6-1	7-6	8-3	9-6
1	-563	239	002	-033	017	-103	-120	-615	-651
2	138	-121	060	-095	-163	129	240	-101	013
3	668	821	769	430	638	276	800	675	585
4	-036	-040	-498	092	029	-376	-096	-042	-140
5	196	588	218	-168	-226	069	251	-072	-170
6	-106	042	-111	-001	139	159	269	135	-012
7	-219	-057	-406	-034	-095	-051	-169	-030	-214
8	046	014	365	172	-048	-015	143	-037	179
9	-019	070	-068	009	-019	102	009	003	111
10	-047	045	-073	145	-035	-077	-009	-009	038
11	-071	203	003	-136	173	-472	052	-058	000
12	-034	207	035	-177	-596	120	-145	037	-033
13	-061	-076	-148	-263	134	-256	107	-038	-105
14	066	009	-073	144	-397	044	080	253	-107
15	143	-040	194	361	-015	-136	141	716	-088
16	161	025	024	655	-132	051	064	288	406
17	154	127	065	013	-190	-027	-104	-076	169
18	088	007	006	091	071	131	-009	103	023
19	008	028	-115	094	-173	102	-239	076	-067
20	586	397	651	413	114	707	499	557	592
21	035	-176	020	421	-020	197	034	166	557
Sums of Squares	1.324	1.404	1.719	1.347	1.181	1.187	1.289	1.922	1.798

[*] Factor labelling: first number indicates the group and the second the number of the factor within the group.

Decimal points have been omitted from the factor loadings.

TABLE XV

COEFFICIENTS OF CONGRUENCY AMONG FACTORS MATCHED AS MEASURING PUPILS' DOING SATISFACTORY WORK

Group	T	3	4	5	6-5	6-1	7	8	9
T	1.00								
3	.55	1.00							
4	.75	.68	1.00						
5	.55	.23	.45	1.00					
6-5	.28	.28	.34	.19	1.00				
6-1	.57	.32	.57	.33	.07	1.00			
7	.77	.68	.79	.45	.52	.55	1.00		
8	.79	.34	.56	.74	.21	.39	.61	1.00	
9	.80	.27	.60	.68	.30	.55	.58	.68	1.00

CHAPTER V

THE FINDINGS IN RELATION TO HYPOTHESES: GENERAL CONCLUSION

This chapter is devoted to a discussion of the findings of the study in relation to the hypotheses developed in Chapter II, and to a consideration of any general conclusion which might be forthcoming from the analysis.

I. HYPOTHESIS ONE

On the basis of the studies reviewed, it was hypothesized that in an analysis of student responses to classroom events, a factor describing the extent of student participation in classroom activity would be revealed. The findings of the study support the existence of such a dimension of response as evidenced in Factor III, (supra., pp. 69-72). The difficulty, however, is in clearly defining this factor and locating it in the various grades studied. As indicated in Table XII, the various factors chosen as most closely approximating participation fail to relate to one another sufficiently to warrant one's concluding that students in various grades respond consis -

tently to their freedom to participate in the planning of classroom activity.

Further research employing a more sensitive and elaborate measure of participation and student response to it might, however, more exactly define and locate such a dimension.

II. HYPOTHESIS TWO

It was also hypothesized that an analysis of student responses to classroom proceedings would reveal a factor describing their awareness of and concern with the disciplinary and restrictive facets of the classroom. This hypothesis is also supported by the findings of the study. As the coefficients of congruence in Table X reveal, the discipline factor is relatively stable from group to group; that is, students in the sample as a whole, and in each of the grade groupings consistently respond so as to indicate their cognizance of classroom discipline.

III. HYPOTHESIS THREE

The third hypothesis of the study related to the possibility of there being developmental changes in the incidence and strength of factors, although no concise expectations were stated. The percentage of the total

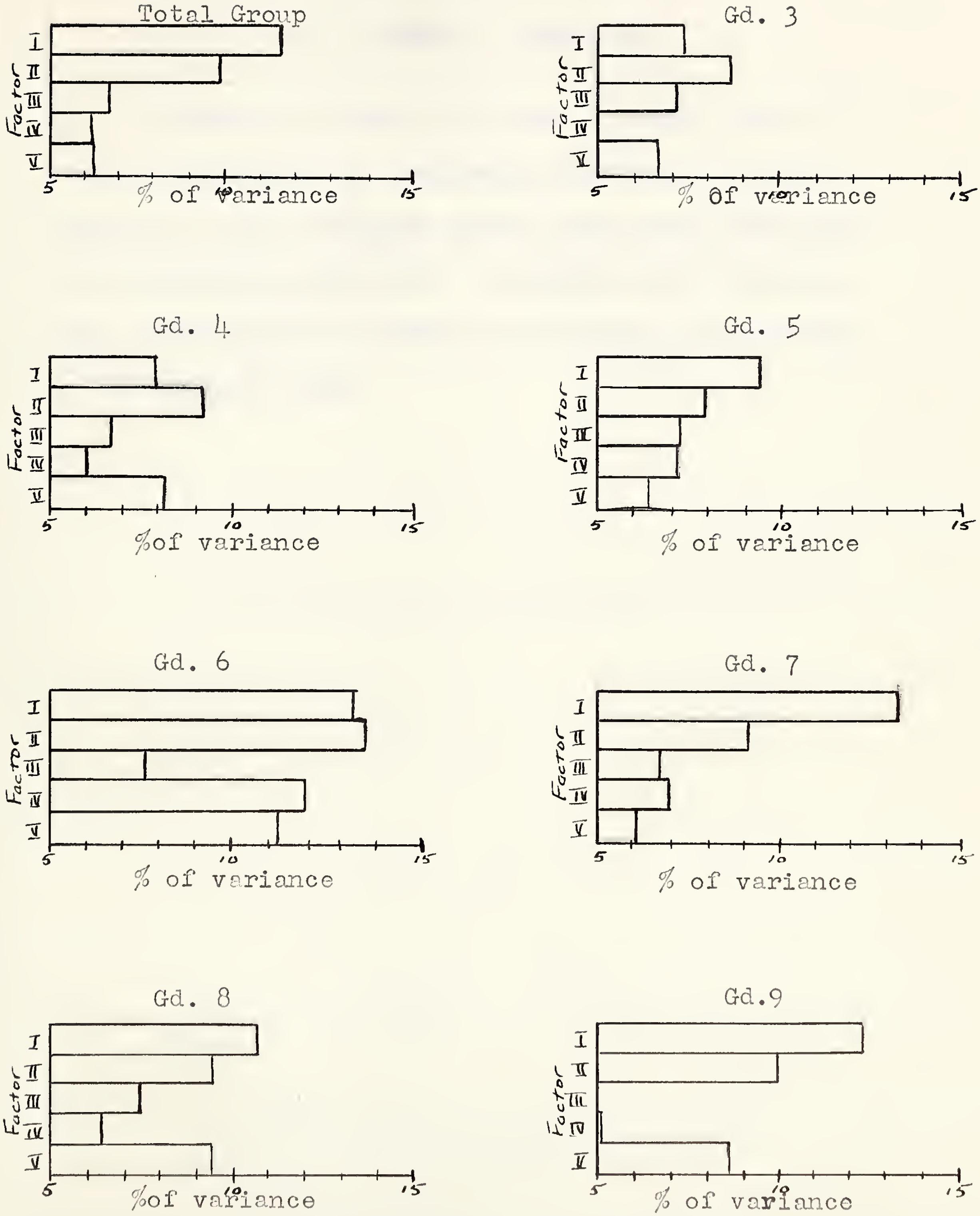
variance accounted for by each of the factors in the total sample and in each grade is illustrated in the accompanying figure. (Figure 2) The findings of the study fail to yield any clear evidence of such developmental changes; however, two possible trends, which prompt further investigation, emerge. Briefly, these are:

1. A relationship between sex, dissatisfaction with classroom instruction and consciously doing one's best work at school. Whereas, boys tend to be dissatisfied to a greater extent and desirous of avoiding the disliked instruction, girls appear to continue to do their best and try to please the teachers even in the later years of junior-high school when boys appear to be most discontented. This is suggested as a result of the findings in connection with Factor IV. (supra., pp. 73-75)

2. There appears to be a tendency for students to become increasingly group-oriented; that is, older children express pride in the classes to which they belong, whereas younger ones place greater emphasis on the individual relationships with the teacher, as suggested by the findings in connection with the satisfaction dimension. (Factor I, supra., pp. 59-64)

FIGURE 2

PERCENTAGE OF TOTAL VARIANCE ACCOUNTED FOR BY FACTORS*



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*Factors are numbered thus: I- Satisfaction, II- Discipline, III- Participation, IV- Questioning Value of Instruction, V- Doing Satisfactory Work.

IV. GENERAL CONCLUSION

Ground is broken for a more intense study of student responses, the dominant dimensions of pupil reaction to the classroom having been more effectively established than hitherto. In further such studies, then, items might be based on the factors established in the present study.

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APPENDICES

APPENDIX A

____

MY CLASS

____

Place a cross (X) after the answer which you think is right.

1. Are you a boy? Yes___ No___
2. Are the children in your class usually polite to each other? Yes___ No___ ?___
3. Is your work usually good enough? Yes___ No___?___
4. Do some of the pupils like to tease the teacher? Yes___ No___?___
5. Do some pupils get scolded a lot? Yes___ No___?___
6. Do the pupils in your class usuall work in groups? Yes___ No___?___
7. Do you ever feel like staying away from school? Yes___ No___?___
8. Do you like to be in this class? Yes___ No___?___
9. Do the pupils often make so much noise that it's hard to work? Yes___ No___?___
10. Do you ever wonder why you have to do what you are doing in school? Yes___ No___?___
11. Do you have much fun in this class? Yes___ No___?___
12. Are you always told what to do and when to do it? Yes___ No___?___
13. Do some pupils break class rules a lot? Yes___ No___?___
14. Did the pupils make up the class rules they are supposed to obey? Yes___ No___?___
15. Do you help plan what the class is going to do? Yes___ No___?___
16. Do you learn a lot in this class? Yes___ No___?___
17. Are the children usually quiet in your room? Yes___ No___?___
18. Are you proud to be in this class? Yes___ No___?___
19. Do the pupils ever waste time because they don't know what to do? Yes___ No___?___
20. Do you always do your best in this class? Yes___ No___?___
21. Do most of the pupils like the teacher? Yes___ No___?___

APPENDIX B

TABLE I

CORRELATION MATRIX FOR QUESTIONNAIRE ITEMS*

TOTAL GROUP N=2023

Item**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	-064	-065	-030	-008	003	080	-098	006	026	-052	039	096	-016	-047	-094	-041	-102	021	-122	-076
2		-	026	-105	-080	054	-093	138	-095	001	106	080	-119	047	103	112	252	165	-063	108	153
3			-	-063	001	039	-105	083	-040	-028	053	001	-024	047	082	111	063	067	-018	224	077
4				-	087	-067	164	-117	127	141	-087	-083	154	-105	-037	-122	-145	-094	109	-172	-108
5					-	-040	127	-104	219	090	-056	032	238	-023	-060	-088	-147	-096	198	-051	-117
6						-	-097	074	022	-051	061	078	-013	116	166	077	029	043	035	069	129
7							-	-223	123	209	-142	-055	083	-091	-099	-176	-127	-132	125	-235	-159
8								-	-041	-082	311	064	-116	044	140	328	133	404	-103	174	324
9									-	090	-035	-002	310	013	001	-057	-311	-067	277	-050	-047
10										-	-059	-015	081	-066	-040	-086	-062	-054	124	-159	-086
11											-	003	-075	056	155	229	087	286	-008	087	218
12												-	-053	036	039	076	040	080	-009	103	088
13													-	012	-061	-115	-198	-130	231	-120	-124
14														-	186	078	067	032	007	100	102
15															-	149	110	129	042	153	125
16																-	117	291	-049	225	334
17																	-	167	-157	123	137
18																		-	-080	204	300
19																			-	-088	-071
20																				-	187
21																					-

*Decimal points have been omitted.

**See Appendix I for questionnaire items.

TABLE II

CORRELATION MATRIX FOR QUESTIONNAIRE ITEMS*

GRADE THREE N = 69

Item**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	239	175	071	112	171	008	044	-053	-021	-020	-043	230	-063	057	132	191	-108	145	-019	-074
2		-	014	055	-026	109	-003	183	107	045	006	002	174	163	163	006	131	075	117	018	175
3			-	055	317	045	-003	047	035	045	129	128	109	031	031	006	232	075	050	218	-015
4				-	-160	070	-002	-014	023	073	123	-026	154	-105	-105	-036	132	-304	011	044	052
5					-	035	043	-030	274	187	109	027	224	238	046	-011	-219	075	326	189	-026
6						-	211	030	148	124	-037	017	233	260	018	076	035	-139	114	002	-064
7							-	275	-027	194	-028	-026	035	-060	003	207	-214	-010	234	-027	-036
8								-	333	022	050	-032	030	-001	127	050	117	261	-007	201	142
9									-	126	-015	145	312	056	123	-015	042	092	413	030	-010
10										-	099	041	248	106	042	020	226	089	213	016	031
11											-	093	037	-044	302	030	-028	068	080	161	118
12												-	-138	081	038	-055	-066	006	-012	106	-035
13													-	260	139	037	035	006	448	-002	064
14														-	259	160	-060	-020	036	-045	-045
15															-	-044	066	203	161	139	133
16																-	028	-068	-036	-014	118
17																	-	-086	-083	027	036
18																		-	118	211	235
19																			-	151	140
20																				-	342
21																					-

*Decimal points have been omitted.

**See Appendix I for questionnaire.

TABLE III

CORRELATION MATRIX FOR QUESTIONNAIRE ITEMS*

GRADE FOUR N= 315

Item**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	-128	-028	090	-012	021	103	-126	059	116	-062	-035	120	-058	-052	-115	-104	-077	078	-144	-048
2		-	058	-086	-028	173	-088	148	-085	-057	210	140	-097	069	055	193	229	194	-131	165	195
3			-	-172	084	-014	-156	072	-040	-046	015	045	-102	-003	047	041	031	-010	-033	248	046
4				-	-049	059	158	-103	123	088	016	-101	117	-065	-052	-066	-070	-043	184	-255	-037
5					-	-033	092	-040	186	045	070	132	247	-014	058	-029	-145	-068	140	019	-026
6						-	001	043	056	-016	088	-019	082	101	236	091	-092	-037	037	-148	204
7							-	-157	100	148	-054	-108	091	-002	003	-168	-095	-017	153	-229	-079
8								-	017	-023	-013	147	-101	-019	000	220	043	192	-111	143	307
9									-	087	043	039	215	009	-010	-005	-301	-071	190	-056	-010
10										-	054	-052	036	030	-011	-103	-010	-087	134	-117	-052
11											-	023	-043	028	-005	163	107	184	068	-006	122
12												-	-046	064	-015	080	-038	044	028	057	077
13													-	115	-005	-033	-251	-148	197	-106	-062
14														-	229	-006	070	-075	044	025	007
15															-	034	093	041	072	140	078
16																-	053	155	-003	019	267
17																	-	149	-202	152	127
18																		-	-085	142	246
19																			-	-129	-072
20																					028
21																					-

*Decimal points have been omitted.

**See Appendix I for questionnaire.

TABLE IV

CORRELATION MATRIX FOR QUESTIONNAIRE ITEMS*

GRADE FIVE   N = 476

Item**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	-040	-062	-031	-047	-003	065	-098	052	024	-064	073	050	013	-044	-067	-066	-135	038	-141	-027
2		-	059	-110	-087	016	-111	122	-062	029	083	077	-065	080	123	074	222	124	-003	093	122
3			-	-024	003	116	-088	065	-076	023	046	-032	-034	-031	104	116	106	085	023	192	060
4				-	058	019	079	-037	059	077	-059	023	111	-114	039	-074	-115	-025	114	-017	-073
5					-	061	079	-032	183	131	035	-030	170	040	-041	-089	-120	020	170	-080	006
6						-	-073	003	-010	033	-045	055	036	093	066	-019	121	016	052	063	-021
7							-	-171	193	164	-139	-005	096	-063	-047	-145	-147	-142	057	-219	-080
8								-	-039	-012	385	021	-046	-067	142	290	105	321	-054	098	312
9									-	106	-068	063	288	021	-041	-107	285	035	314	059	058
10										-	-065	019	073	-010	023	-004	-040	-070	116	-095	-027
11											-	-068	-038	-072	137	149	092	289	-093	007	195
12												-	018	-024	-017	035	034	111	-000	036	112
13													-	-022	-046	-136	-101	-061	240	-015	-142
14														-	092	041	096	-022	-029	091	021
15															-	175	189	089	085	144	094
16																-	123	206	-038	161	285
17																	-	137	-075	143	071
18																		-	-117	169	269
19																			-	-057	-070
20																				-	101
21																					-

*Decimal points have been omitted.

**See Appendix I for questionnaire.

TABLE V

CORRELATION MATRIX FOR QUESTIONNAIRE ITEMS*

GRADE SIX   N = 214

Item**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	-016	025	-050	015	-002	177	-012	-092	031	-011	060	127	-051	-002	-094	089	052	046	-105	-091
2		-	058	-107	-285	-096	-135	274	-203	017	141	116	-243	091	000	192	283	283	-112	126	123
3			-	-033	-024	044	-031	022	-052	030	109	-064	-004	-045	-007	050	-003	188	-066	171	056
4				-	256	002	033	-114	198	090	-007	-118	185	-009	082	-114	-247	-180	132	-141	-078
5					-	147	157	-117	282	062	-180	013	231	096	-003	-117	-181	-290	310	-086	-198
6						-	-094	-003	124	075	006	-050	084	140	101	-061	-074	-048	155	-010	-088
7							-	-113	032	166	-168	-012	126	-041	-062	-198	-091	-148	-094	-188	-236
8								-	-110	087	302	110	-049	087	093	242	158	476	-072	090	097
9									-	108	-053	-066	293	055	047	-027	-351	-096	347	-008	027
10										-	032	-015	004	-093	123	-022	003	061	103	-030	-079
11											-	075	150	099	205	179	142	290	011	-071	149
12												-	-069	081	067	110	088	144	003	-003	054
13													-	076	042	-020	-217	-137	280	-118	-024
14														-	129	058	082	046	046	060	086
15															-	-020	076	075	119	055	-038
16																-	073	264	010	179	332
17																	-	156	-168	022	081
18																		-	-078	183	284
19																			-	-006	-039
20																				-	227
21																					-

*Decimal points have been omitted.

**See Appendix I for questionnaire.

TABLE VI

CORRELATION MATRIX FOR QUESTIONNAIRE ITEMS*

GRADE SEVEN   N = 226

Item**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	007	-115	016	-003	010	027	-151	-065	-054	-155	100	074	-021	-059	-125	-045	-097	-081	-049	-070
2		-	055	-136	-035	130	006	091	-078	097	100	-004	-293	186	215	050	352	106	-040	097	078
3			-	-039	-018	074	-150	156	-010	-047	161	-064	075	085	126	174	-042	073	-119	198	124
4				-	095	-070	160	-171	191	101	-022	-141	113	036	-165	-197	-178	-135	056	-179	-122
5					-	-107	139	-121	181	064	-060	-043	137	-194	-204	-181	-160	-205	172	-026	-191
6						-	-021	088	-053	052	005	112	-039	147	149	106	112	156	-076	078	082
7							-	-305	171	224	-225	041	-017	-031	-220	-171	-096	-197	171	-121	-165
8								-	-094	-156	350	092	-131	033	228	424	196	532	-230	305	365
9									-	149	-046	-063	194	-088	-066	-124	-321	-053	117	-201	-093
10										-	-175	112	009	-094	-059	-240	-036	-136	137	-173	-138
11											-	005	-117	023	271	312	170	355	-108	151	334
12												-	-103	-073	-023	058	123	088	-094	083	066
13													-	-049	-226	-059	-304	-036	116	-135	-020
14														-	268	076	097	058	-042	-018	250
15															-	258	181	303	-152	199	219
16																-	150	482	-168	214	368
17																	-	184	-100	149	160
18																		-	-172	249	296
19																			-	206	-152
20																				-	237
21																					-

*Decimal points have been omitted.

**See Appendix I for questionnaire.

TABLE VII

CORRELATION MATRIX FOR QUESTIONNAIRE ITEMS*

GRADE EIGHT N = 249

Item**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	-034	-163	-091	-030	-039	-023	009	-052	-041	012	025	098	047	-085	-101	004	-065	-050	-150	-060
2		-	-012	-052	008	-041	-012	180	-119	018	114	087	-102	-097	-003	183	202	234	037	109	141
3			-	-147	-056	087	-149	063	-049	-010	-043	-020	-097	178	189	089	025	040	021	285	110
4				-	173	029	157	-028	100	227	-035	034	099	-071	-039	-065	-035	-048	021	-113	004
5					-	060	091	-116	255	-026	-097	182	231	-100	-053	-100	-164	-070	143	-098	-100
6						-	-014	004	115	-104	-013	-047	090	-057	099	-086	-082	-031	031	021	026
7							-	-149	099	135	081	010	-060	-114	-061	-070	-057	061	155	-142	-118
8								-	-092	034	235	-067	-143	018	145	260	123	436	019	118	347
9									-	125	-009	-024	448	018	045	-049	-335	-122	177	-110	-132
10										-	018	022	039	-059	-107	006	-054	015	036	-120	-016
11											-	-149	-053	063	138	179	-018	302	095	051	083
12												-	-073	-128	-052	010	-073	-045	-077	096	072
13													-	111	-036	-196	-147	-215	110	-245	-073
14														-	259	087	-054	044	046	097	087
15															-	193	055	184	062	125	173
16																-	067	286	016	219	187
17																	-	236	-137	135	134
18																		-	017	235	241
19																			-	-105	-026
20																				-	239
21																					-

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*Decimal points have been omitted.

**See Appendix I for questionnaire.

TABLE VIII

CORRELATION MATRIX FOR QUESTIONNAIRE ITEMS[*]

GRADE NINE   N = 114

Item[**]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	-245	-166	017	030	-028	116	-175	104	-032	-044	039	190	046	-005	-206	-187	-124	033	-278	-147
2		-	-068	035	021	103	083	006	-050	-002	-096	016	-028	-254	170	050	215	097	161	-043	061
3			-	-194	-243	-047	-147	110	-146	115	118	-066	-131	177	035	147	215	094	-041	236	152
4				-	123	002	246	113	219	057	098	069	207	231	085	-149	-190	-060	161	011	175
5					-	-023	-080	-095	134	-005	142	059	232	-108	-041	093	011	069	199	-054	218
6						-	122	049	030	008	-013	060	-042	-013	-003	030	-013	-032	023	-157	176
7							-	-146	057	107	111	086	007	-112	-015	-262	-150	121	-014	-095	-097
8								-	-118	091	502	-057	-171	098	013	323	169	589	-118	224	343
9									-	032	-152	-107	491	-198	-037	-255	-464	-183	494	-176	-262
10										-	092	171	-019	045	027	-019	-046	091	038	-125	003
11											-	-018	-208	106	003	256	027	390	030	035	370
12												-	086	-010	-061	-040	-049	-010	-048	010	060
13													-	004	-057	-183	-338	-195	302	-203	316
14														-	013	071	093	154	-180	-002	057
15															-	-019	-025	063	025	034	-049
16																-	225	239	-042	278	219
17																	-	258	-218	080	182
18																		-	-049	207	193
19																			-	-161	-060
20																				-	140
21																					-

[*] Decimal points have been omitted.

[**] See Appendix I for questionnaire.

TABLE IX

CORRELATION MATRIX FOR QUESTIONNAIRE ITEMS[*]

GROUP Q (MULTIPLE GRADE CLASSES IN GRADES FOUR TO SIX)

N = 309

Item[**]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	-142	-073	-083	037	-053	188	184	027	140	-038	-036	102	-067	-143	-125	-061	-224	050	-231	-147
2		-	-010	-170	-140	083	-246	074	-198	-076	069	060	-092	-004	147	069	292	102	-130	197	245
3			-	108	-010	-053	-061	080	-036	-087	-014	076	052	013	062	116	095	029	000	169	009
4				-	016	-146	100	-071	193	029	-113	-045	238	-003	046	-070	-244	-008	152	-076	-087
5					-	-210	243	-155	295	133	-079	035	353	-072	-082	-036	-170	-087	243	023	-168
6						-	-052	111	-163	-068	174	122	-232	084	223	174	122	099	-024	051	317
7							-	-244	274	193	-120	-083	168	-044	-103	-050	-151	-158	190	-202	-151
8								-	-102	163	201	032	-158	110	089	285	113	214	176	020	308
9									-	127	-086	-105	399	-018	-034	-042	-326	-096	333	-002	-172
10										-	055	058	164	-038	-032	033	-141	-064	178	-055	-076
11											-	009	-137	074	097	175	056	108	027	-020	134
12												-	-044	081	085	078	154	077	089	088	140
13													-	-068	-005	-022	-204	150	313	-039	-254
14														-	187	074	046	048	075	014	049
15															-	142	115	055	042	053	120
16																-	100	299	-038	219	362
17																	-	155	-232	126	235
18																		-	-025	143	428
19																			-	-041	-107
20																				-	093
21																					-

[*] Decimal points have been omitted.

[**] See Appendix I for questionnaire items.

TABLE X

CORRELATION MATRIX FOR QUESTIONNAIRE ITEMS[*]

GROUP I (MULTIPLE GRADE CLASSES IN GRADES SEVEN TO NINE)

N = 51

Item[**]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	-025	-147	030	-215	-017	259	106	034	-068	054	057	022	-067	136	-071	-139	237	-263	-096	-124
2		-	-294	052	107	-066	-280	105	032	110	159	280	-280	-001	180	091	330	284	-233	-066	201
3			-	-032	-034	192	103	-037	187	-039	-004	238	103	080	-151	-041	-016	-006	-059	263	019
4				-	056	046	020	-055	215	072	035	-107	280	108	-247	205	000	048	-072	-128	131
5					-	-142	-101	-008	147	-014	176	-057	057	213	-056	071	056	-010	023	017	124
6						-	006	055	127	-102	-011	313	086	033	327	-094	322	-068	246	121	055
7							-	269	123	010	220	188	-267	-045	118	103	056	297	038	-073	-103
8								-	168	116	297	039	039	-010	188	283	-020	449	044	-055	224
9									-	-039	144	078	193	087	261	-090	271	006	261	-055	290
10										-	049	-092	010	013	-201	031	087	204	-034	-102	133
11											-	-025	-025	007	004	212	-065	356	004	011	136
12												-	-129	-045	524	-018	-111	001	-118	-086	103
13													-	045	-283	-152	-139	098	118	006	-103
14														-	022	039	181	052	-022	-033	080
15															-	035	-254	-038	-052	085	151
16																-	164	252	179	162	429
17																	-	087	-254	-112	080
18																		-	-038	-019	278
19																			-	-237	-032
20																				-	101
21																					-

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[*] Decimal points have been omitted.

[**] See Appendix I for questionnaire items.

APPENDIX C

TABLE I

ROTATED FACTOR MATRIX AND TRANSFORMATION MATRIX*
(TOTAL GROUP)

Item	I'	II'	III'	IV'	V'	VI'	h²
1	-147	058	056	-121	-563	302	452
2	201	-335	176	393	138	300	447
3	006	014	057	-085	668	034	459
4	-076	229	-106	338	-036	-425	365
5	-130	523	-130	197	196	210	429
6	079	050	580	-099	-106	129	382
7	-233	143	-140	492	-219	-078	390
8	731	-064	-005	-088	046	022	548
9	040	719	047	064	-019	-008	525
10	-059	100	-069	680	-047	-020	483
11	617	-011	122	-016	-071	-129	417
12	082	047	-020	040	-034	781	622
13	-122	617	040	031	-061	-024	402
14	-019	008	644	-119	066	034	435
15	186	-043	657	103	143	-089	507
16	599	-035	064	-107	160	085	409
17	105	-590	175	209	154	170	486
18	692	-113	-043	069	087	075	512
19	-039	540	192	283	008	-000	411
20	199	-064	099	-270	586	254	534
21	602	-080	132	-060	035	120	406
Sums of Squares	2.374	2.044	1.392	1.299	1.324	1.188	9.621
% of Common Variance	24.67	21.25	14.47	13.50	13.76	12.35	100.0
% of Total Variance	11.3	9.7	6.6	6.2	6.3	5.7	45.8

	I'	II'	III'	IV'	V'	VI'
I	717	-489	267	-226	290	198
II	427	828	300	136	150	031
III	-503	079	575	-504	241	315
IV	-045	-200	546	598	-465	294
V	-218	-137	065	553	777	-143
VI	-018	098	-454	118	126	868

* Decimal points have been omitted from factor loadings.

TABLE II

ROTATED FACTOR MATRIX AND TRANSFORMATION MATRIX[*]

(Grade Three)

Item	Common Factor Loadings										h^2
	I'	II'	III'	IV'	V'	VI'	VII'	VIII'	IX'	X'	
1	156	113	138	093	018	239	130	801	-036	067	786
2	059	-065	-141	-076	-119	-121	-283	676	-123	-050	617
3	-021	-052	011	-014	013	821	-028	183	-026	-155	738
4	071	-113	835	-034	086	-040	-061	-009	-029	-115	743
5	519	018	-239	069	-169	588	035	-112	-021	116	733
6	131	004	237	-186	-653	042	-131	130	129	-016	587
7	197	123	-032	814	283	-057	-166	-039	-023	-018	831
8	-138	-156	-085	259	050	014	-824	171	-070	-033	835
9	450	064	015	-148	-140	070	-715	-078	041	-020	773
10	327	015	-024	181	-069	045	004	-181	002	-801	823
11	115	-284	269	004	124	203	130	-016	-661	243	736
12	-065	032	005	-069	-070	207	-132	-174	-102	045	118
13	572	019	147	-015	-221	-076	028	206	-021	-154	471
14	071	099	-195	091	-799	009	020	-060	-199	-060	746
15	048	-033	-191	-141	-162	-040	-119	-123	-796	-090	736
16	-159	-200	068	675	-390	025	086	134	134	-006	721
17	-276	-028	149	-213	028	127	-110	387	066	-696	812
18	061	-346	-660	-068	168	007	-203	-005	-159	-111	671
19	831	-121	-017	063	060	028	-106	075	-095	-021	740
20	031	-688	-001	-046	047	397	-149	-073	-085	071	676
21	072	-856	-038	032	011	-176	027	052	-083	-061	785
Sums of Squares	1.840	1.550	1.491	1.366	1.504	1.404	1.483	1.500	1.235	1.305	14.678
% of Common Variance	12.53	10.56	10.16	9.31	10.25	9.57	10.10	10.22	8.41	8.89	100.00
% of Total Variance	8.8	7.4	7.1	6.5	7.2	6.7	7.1	7.1	5.9	6.2	70.0

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[*] Decimal points have been omitted from factor loadings.

TABLE II (continued)

	I'	II'	III'	IV'	V'	VI'	VII'	VIII'	IX'	X'
I	645	-262	-086	096	-287	285	-366	214	-317	-233
II	205	509	495	-093	-435	-021	211	324	291	-148
III	-456	-410	407	-195	141	025	-109	498	-151	-341
IV	144	027	139	659	327	-466	-308	180	259	-087
V	252	-019	406	085	553	585	189	-232	146	-071
VI	-296	-049	-137	668	-259	381	388	241	-112	108
VII	161	-273	436	136	-151	-410	393	-369	-465	016
VIII	285	-338	026	-167	114	-085	209	443	168	699
IX	-124	-482	192	068	-435	102	-226	-354	575	064
X	-197	282	390	081	-068	168	-527	-074	-340	540

TABLE III

ROTATED FACTOR MATRIX AND TRANSFORMATION MATRIX*

(Grade Four)

Item	Common Factor Loadings								h²
1	-050	059	002	-166	-122	-571	135	324	498
2	216	267	060	177	502	083	-220	-075	465
3	-036	072	769	-058	074	-125	087	115	643
4	-200	045	-498	-110	051	-104	304	-026	409
5	-580	-191	218	125	155	-036	-188	-121	511
6	-089	525	-111	384	115	-024	208	399	660
7	-201	-180	-406	131	-114	-329	156	-326	506
8	-076	504	365	-023	-303	069	-471	-245	773
9	-648	129	-068	-069	-065	-050	-020	-071	460
10	-049	-082	-073	050	078	-774	-092	-076	637
11	-083	081	003	-068	828	-035	056	-073	714
12	-083	081	035	001	075	-011	-801	037	663
13	-579	-057	-148	136	-044	089	002	202	429
14	006	-087	-073	707	060	013	-262	133	603
15	-074	147	194	735	-051	-007	228	-127	676
16	-020	510	024	-095	296	275	-095	028	443
17	595	-066	065	202	305	-053	008	-257	565
18	127	314	006	-087	185	082	061	-638	574
19	-535	-070	-115	083	138	-198	095	-017	378
20	078	-054	651	124	-027	195	-042	-335	600
21	072	716	020	056	071	-051	-053	-183	566
Sums of Squares	1.925	1.634	1.719	1.409	1.367	1.251	1.291	1.177	11.773
% of Common Variance	16.35	13.88	14.60	11.97	11.62	10.62	10.97	9.98	100.00
% of Total Variance	9.2	7.8	8.2	6.7	6.5	6.0	6.1	5.6	56.1

*Decimal Points have been omitted from factor loadings.

TABLE III (continued)

	I'	II'	III'	IV'	V'	VI'	VII'	VIII'
I	561	440	433	084	267	315	-227	-273
II	-606	610	-151	305	352	-048	-131	-009
III.	-447	-271	698	123	-212	193	-362	105
IV.	210	-228	038	892	086	-086	245	181
V	-100	-446	104	-065	619	-343	-062	-520
VI	-049	-320	-359	-010	373	754	-160	179
VII	-147	078	389	-230	296	174	777	214
VIII	199	006	098	-180	377	-370	-327	730

TABLE IV

ROTATED FACTOR MATRIX AND TRANSFORMATION MATRIX*

(Grade Five)

Item	Common Factor Loadings								h²
	I'	II'	III'	IV'	V'	VI'	VII'	VIII'	
1	-129	074	102	534	131	-092	001	033	345
2	197	-049	-101	227	-035	-163	594	095	492
3	-044	-073	-289	-326	-065	145	115	-430	421
4	-095	176	-015	-124	089	639	-028	-092	481
5	158	374	-303	-387	306	-201	-213	168	615
6	-066	019	-680	-152	-011	-032	133	001	509
7	-165	102	089	111	579	078	-142	034	421
8	704	-013	075	-002	-047	166	189	-172	597
9	023	743	027	146	088	-054	-194	-009	623
10	-039	118	-200	-027	687	055	164	-145	579
11	641	-012	224	-260	-076	-017	203	136	594
12	117	076	-386	062	-417	619	-033	177	761
13	-030	654	-056	-030	-090	135	042	263	530
14	-198	111	-177	025	-138	-709	087	-144	633
15	004	119	151	-103	-009	010	603	-361	542
16	313	-096	105	050	-036	-105	080	-655	568
17	218	-062	-270	-093	-040	-035	667	-013	581
18	675	-037	-191	-040	-167	036	018	-091	532
19	-157	652	025	-018	148	098	232	-094	546
20	032	068	-171	-138	-576	028	098	-413	566
21	530	-091	041	051	099	-227	-047	-421	535
Sums of Squares	1.993	1.674	1.121	.784	1.543	1.525	1.483	1.347	11.470
% of Common Variance	17.38	14.59	9.77	6.84	13.45	13.30	12.93	11.74	100.00
% of Total Variance	9.5	8.0	5.4	3.7	7.3	7.3	7.1	6.4	54.7

*Decimal points have been omitted from Factor loadings.

TABLE IV (continued)

	I'	II'	III'	IV'	V'	VI'	VII'	VIII'
I	611	-416	-038	-118	-363	-143	384	-371
II	466	776	-121	-185	243	131	108	-207
III	521	-172	564	055	179	164	-533	186
IV	145	018	015	768	387	-433	226	-006
V	-188	-289	278	-290	674	219	367	-287
VI	051	-110	-252	476	-068	822	061	-104
VII	-268	292	654	215	-380	036	080	-465
VIII	079	116	310	-031	-153	153	600	690

TABLE V

ROTATED FACTOR MATRIX AND TRANSFORMATION MATRIX*

(Grade Six)

Item	Common Factor Loading							h²
	I'	II'	III'	IV'	V'	VI'	VII'	
1	103	036	013	-048	017	749	012	576
2	-129	435	-392	024	-163	-080	-155	417
3	-276	-012	-194	085	638	197	056	570
4	376	-481	-026	-046	029	-366	-289	594
5	-069	-575	273	186	-226	076	-123	516
6	-159	-188	144	666	139	-028	083	552
7	051	-103	307	-229	-095	499	-365	551
8	015	163	-623	236	-048	061	-235	531
9	-102	-769	-064	141	-019	-118	-105	651
10	077	-111	-120	029	-035	033	-725	561
11	472	015	-616	370	173	036	042	772
12	-120	070	-243	027	-596	228	-052	489
13	256	-734	-147	048	134	111	282	738
14	-044	-110	-150	519	-397	-029	301	555
15	136	-019	-132	647	-015	-118	-225	521
16	-051	-158	-702	-131	-132	-260	-005	622
17	027	621	-117	163	-190	134	039	482
18	-131	167	-752	066	071	152	-091	651
19	-102	-656	-091	281	-173	136	-163	603
20	-707	-028	-261	063	114	-151	122	623
21	-197	-121	-610	-145	-020	-162	311	570
Sums of Squares	1.187	2.869	2.806	1.600	1.181	1.271	1.231	12.145
% of Common Variance	9.77	23.62	23.11	13.17	9.72	10.47	10.14	100.00
% of Total Variance	5.7	13.7	13.4	7.6	5.6	6.1	5.9	58.0

*Decimal points have been omitted from factor loadings.

TABLE V (continued)

	I'	II'	III'	IV'	V'	VI'	VII'
I	-173	677	-702	015	003	-077	111
II	-004	629	597	-476	016	122	077
III	369	235	-001	393	-152	647	-462
IV	-063	178	290	596	-544	-212	429
V	-604	116	239	451	567	021	-198
VI	-576	-211	-095	-194	-305	642	268
VII	366	-018	-029	148	516	321	688

TABLE VI

ROTATED FACTOR MATRIX AND TRANSFORMATION MATRIX*

Item	Common Factor Loadings ~~(Grade Seven)~~							h²
	I'	II'	III'	IV'	V'	VI'	VII'	
1	-301	-076	095	101	620	120	014	514
2	-004	692	125	-186	-057	-240	076	596
3	110	-088	086	069	-082	-800	019	679
4	-163	-142	-007	-091	016	096	801	706
5	-222	-096	-533	-163	-203	-251	055	476
6	119	047	457	-389	221	-269	-145	519
7	-285	-006	-053	-507	-086	169	034	378
8	737	116	-068	094	077	-143	-060	600
9	038	-401	-159	-432	-187	-009	357	536
10	-170	084	-043	-699	-064	009	061	535
11	613	166	-107	173	-145	-052	213	513
12	199	088	-106	-410	517	145	-271	588
13	-058	-750	078	-016	-057	-107	-062	591
14	005	101	774	080	-133	-080	125	655
15	355	349	302	068	099	-141	539	664
16	696	-011	138	129	006	-064	-133	542
17	188	678	120	051	007	104	-208	565
18	775	044	080	-025	102	009	-001	619
19	-186	-119	-010	-206	-598	239	-136	525
20	286	247	-167	157	243	-499	-127	520
21	441	-062	286	062	-033	-034	-055	289
Sums of Squares	2.822	1.975	1.428	1.477	1.284	1.289	1.335	11.610
% of Common Variance	24.31	17.01	12.30	12.72	11.06	11.10	11.50	100.00
% of Total Variance	13.4	9.4	6.8	7.0	6.1	6.1	6.4	55.2

*Decimal points have been omitted from factor loadings.

TABLE VI (continued)

	I'	II'	III'	IV'	V'	VI'	VII'
I	796	386	255	261	150	-235	-078
II	-364	783	237	-262	191	213	-220
III	-002	094	491	-253	-416	-103	710
IV	-351	-163	531	676	319	042	087
V	162	-400	368	-574	586	048	-056
VI	274	015	-109	109	063	904	281
VII	-091	208	-457	034	565	-259	594

TABLE VII

ROTATED FACTOR MATRIX AND TRANSFORMATION MATRIX[*]
(Grade Eight)

Item	Common Factor Loadings							h^2
	I'	II'	III'	IV'	V'	VI'	VII'	
1	011	045	615	068	-215	-277	188	543
2	495	-142	101	-342	087	083	-032	408
3	-039	-005	-675	057	-201	-112	-005	513
4	-008	103	042	-049	037	735	-154	580
5	-036	486	072	-494	110	039	-218	548
6	-011	129	-135	083	-040	-067	-781	659
7	-019	040	030	-003	706	203	007	543
8	711	-067	027	100	-210	078	-036	572
9	-071	742	-003	-006	051	155	-087	590
10	029	063	009	042	080	713	318	623
11	523	092	058	317	299	-113	088	496
12	-022	049	-037	-771	-109	-007	177	643
13	-137	639	308	106	-277	113	-164	649
14	033	275	-253	413	-322	-162	351	565
15	124	069	-716	461	137	025	053	768
16	501	-004	-288	-060	015	-072	313	441
17	245	-565	076	063	-146	041	-160	438
18	725	-153	-103	052	114	000	-004	575
19	148	438	-076	072	431	-104	-016	421
20	226	-199	-557	-207	-184	-168	028	507
21	509	-070	-166	-078	-415	134	-068	492
Sums of Squares	2.237	1.925	1.992	1.545	1.386	1.339	1.150	11.574
% of Common Variance	19.33	16.63	17.21	13.35	11.97	11.57	9.94	100.00
% of Total Variance	10.7	9.2	9.5	7.4	6.6	6.4	5.5	55.3

[*] Decimal points have been omitted from factor loadings.

TABLE VII (continued)

	I'	II'	III'	IV'	V'	VI'	VII'
I	732	-472	-384	084	-192	-195	112
II	406	805	-291	265	090	110	-113
III	442	-110	414	-253	549	500	070
IV	071	-058	517	790	072	-213	223
V	-314	-233	-572	360	498	304	223
VI	-022	022	038	106	-620	671	390
VII	-006	245	-025	-306	127	-334	847

TABLE VIII

ROTATED FACTOR MATRIX AND TRANSFORMATION MATRIX[*]

(Grade Nine)

Item	Common Factor Loadings									h^2
	I'	II'	III'	IV'	V'	VI'	VII'	VIII'	IX'	
1	-056	093	334	-039	038	-651	-008	065	181	587
2	-081	-025	-800	180	-086	013	-042	-032	-201	731
3	025	-035	036	-025	-197	585	126	-294	421	664
4	223	538	-033	-054	-170	-140	-151	004	-464	629
5	150	127	-221	-161	664	-174	-266	175	-097	696
6	047	007	-068	834	-002	-012	022	-008	-025	704
7	-090	170	644	055	-214	-214	-050	-115	103	573
8	823	009	-021	067	-163	179	074	013	019	746
9	-184	757	204	035	263	111	066	-007	-187	771
10	117	008	029	047	055	038	-264	-813	017	753
11	800	-037	119	011	104	000	-021	-069	017	672
12	-034	030	007	-045	011	-033	-786	-228	000	676
13	-221	746	-006	-008	300	-105	-136	085	215	779
14	150	-070	191	-020	-151	-107	-022	-033	750	662
15	302	-020	-590	-324	-337	-088	354	-263	184	894
16	389	-284	-126	-033	237	406	-007	153	071	499
17	148	-468	-458	088	003	169	-097	119	252	574
18	717	-147	-182	-099	-009	033	022	-090	089	597
19	-069	209	105	126	774	-067	100	-144	-106	721
20	175	-006	001	-407	-319	592	-101	263	-086	736
21	473	494	019	277	014	557	017	036	-037	857
Sums of Squares	2.568	2.092	1.934	1.154	1.657	1.798	.988	1.069	1.261	14.521
% of Common Variance	17.69	14.41	13.32	7.95	11.41	12.38	6.80	7.36	8.68	100.00
% of Total Variance	12.2	10.0	9.2	5.5	7.9	8.6	4.7	5.1	6.0	69.2

[*] Decimal points have been omitted from factor loadings.

TABLE VIII (continued)

	I'	II'	III'	IV'	V'	VI'	VII'	VIII'	IX'
I	622	-503	-232	-065	-205	424	-022	064	277
II	609	650	-051	082	410	118	-083	-000	-094
III	021	015	674	-263	250	048	214	033	604
IV	350	-054	345	201	-354	-494	-354	-469	029
V	-075	-242	-172	348	467	-290	-499	344	340
VI	-294	308	-075	491	-230	480	-145	-297	425
VII	105	-106	-280	381	185	-332	709	-266	190
VIII	131	169	230	399	-443	-103	215	699	-014
IX	-010	358	-452	-461	-318	-354	-046	097	466

TABLE IX

ROTATED FACTOR MATRIX AND TRANSFORMATION MATRIX[*]

(Multiple Grade Classes - Grades Four to Six)

Item	Common Factor Loadings							h2
	I'	II'	III'	IV'	V'	VI'	VII'	
1	-041	-162	-544	319	-429	-057	034	614
2	-199	093	491	124	053	086	391	468
3	017	136	044	-025	053	-790	-025	649
4	294	-174	-082	-437	095	-347	-235	499
5	651	055	021	391	103	037	-099	602
6	-221	477	-146	-302	075	328	060	505
7	320	063	-349	102	-043	263	-552	614
8	-099	256	-075	-157	-667	-204	423	770
9	704	-135	023	-069	-012	099	-126	545
10	181	-058	082	-020	-809	220	-250	809
11	085	190	-160	-077	017	179	689	582
12	-019	488	-073	072	004	-227	-164	327
13	688	-194	052	108	-005	-164	-049	554
14	-075	055	-011	-591	-124	-010	-018	374
15	025	161	124	-560	079	022	167	390
16	049	572	271	-144	-291	-018	021	509
17	-414	362	112	247	118	-161	171	446
18	008	588	173	-060	070	-051	161	413
19	678	078	-231	-117	-121	-083	177	586
20	-026	147	774	-019	-150	-128	-109	672
21	-175	707	077	-078	-007	073	178	580
Sums of Squares	2.393	2.079	1.525	1.383	1.478	1.202	1.448	11.508
% of Common Variance	20.79	18.07	13.25	12.02	12.84	10.45	12.58	100.00
% of Total Variance	11.4	9.9	7.3	6.6	7.0	5.7	6.9	54.8

[*] Decimal points have been omitted from factor loadings.

TABLE IX (continued)

	I'	II'	III'	IV'	V'	VI'	VII'
I	632	-581	-286	160	-027	024	-394
II	669	520	087	-336	-364	-117	124
III	181	-040	686	-057	537	-385	-234
IV	061	165	301	865	-353	-076	007
V	259	163	-400	304	575	-179	540
VI	150	341	091	105	339	812	-259
VII	165	-469	425	-080	-093	374	646

TABLE X

ROTATED FACTOR MATRIX AND TRANSFORMATION MATRIX[*]

(Multiple Grade Classes - Grades Seven to Nine)

Variable	Common Factor Loadings									h²
	I'	II'	III'	IV'	V'	VI'	VII'	VIII'	IX'	
1	212	102	120	-182	-661	261	-109	192	187	692
2	083	272	-048	-497	318	422	262	-137	-054	701
3	067	057	058	817	062	-012	085	-080	064	701
4	-220	-119	552	-228	-201	146	266	-105	-349	683
5	-100	-195	035	-025	221	053	-124	-761	004	696
6	-047	512	170	363	-040	-303	401	174	-008	710
7	391	-550	-156	109	-449	-202	136	-117	-014	766
8	565	060	002	-007	-030	-154	-065	-020	-087	360
9	054	115	451	076	-082	-311	262	-469	019	618
10	400	-250	071	-096	385	039	224	177	107	479
11	425	099	-150	093	-100	-016	-212	-271	050	353
12	069	803	-005	070	013	074	012	132	057	682
13	118	-092	830	151	075	-107	-169	012	122	795
14	262	030	002	015	-178	071	400	-733	-276	880
15	-052	791	-213	-074	-167	-030	-198	-140	-023	767
16	075	-173	-148	-021	-050	-111	021	013	-779	680
17	-112	-111	-051	-026	110	093	887	-079	-052	844
18	643	-139	085	-039	-044	132	046	018	-072	468
19	021	-024	054	-025	132	-868	-094	-004	-067	789
20	-090	097	-055	550	145	332	-268	047	-405	693
21	103	164	141	-006	197	030	061	-165	-568	451
Sums of Squares	1.473	2.172	1.403	1.507	1.160	1.453	1.622	1.632	1.386	13.808
% of Common Variance	10.67	15.73	10.16	10.91	8.40	10.52	11.75	11.82	10.04	100.00
% of Total Variance	7.0	10.3	6.7	7.2	5.5	6.9	7.7	7.8	6.6	65.7

[*] Decimal points have been omitted from factor loadings.

TABLE X (continued)

	I'	II'	III'	IV'	V'	VI'	VII'	VIII'	IX'
I	708	291	-091	-139	-113	039	238	-348	-440
II	-083	780	-379	196	-290	-044	-167	173	243
III	-274	274	414	484	172	-433	270	-362	-150
IV	435	-263	237	301	-453	-462	-366	153	139
V	-028	-138	-403	467	299	075	-480	-009	-524
VI	118	-080	174	584	-209	647	331	177	068
VII	083	-199	-477	134	111	-412	594	416	-013
VIII	077	293	447	-147	226	-009	-069	700	-376
IX	446	107	037	138	687	026	-104	-033	534

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